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A Two-Piece Small Type Converter

Its Construction Obviates the Necessity of
Two Vessels—Details of Procedure by
Which Time Is Saved in Making Repairs

—BY A. F. BLACKWOOD—

Since the introduction of small converters for the manufacture of light and intricate steel castings such as are used in the automobile and allied trades, it has been found in practice that owing to the high temperature at which the metal must be poured in order to run the thin sections called for, the wear on the lining is most severe. It is impossible with the ordinary converter to get the maximum output and run continuously every day without having to shut down for repairs. The expense

repair cannot be properly carried out, and the time taken is very expensive. During this time the converter is out of use, and the product of the foundry is, therefore, proportionately reduced.

In general practice, in order to produce steel every day it has been found necessary to have two converters, which are operated alternately, one being repaired while the other is blowing. To overcome this difficulty the writer has designed and patented a two-piece converter,



Fig. 1—Top Half of Two-Part Converter Being Rammed Up



Fig. 2—Bottom Half Being Rammed Up. Tuyeres Easily Accessible

of repairs is very high, due to the time it takes for cooling, and many ideas have been tried for the reduction of this time. One method was to blow cold air into the converter after the last blow, this being done for about four hours; but the cost was prohibitive and the wear on blowers very high. Another method, which is used extensively at the present time, is to make one repair every week and blow continuously all week on this repair. This is not advantageous, because after each day's blowing the converter lining is badly worn, with the consequence that the converter becomes larger and out of shape and the tuyeres are burned away and have an irregular line. As this keeps on increasing each day the blows toward the end of the weeks must be irregular, cold and dirty, which has been one of the drawbacks to the use of a converter for the manufacture of steel castings. When the converter is finally shut down for repairs it takes from 12 to 24 hours for it to cool enough for a man to stand comfortably inside to make the necessary repairs; and owing to the small space there is for working the

which in practice has eliminated this period of inactivity and has rendered the operation continuous, thus cutting down expense, doubling the capacity of the plant and making the output of one converter equal to two with the consequence that inactive, costly equipment is entirely cut out. This two-piece converter requires no mechanism for effecting the separation of the parts other than an overhead or jib crane.

It is a well-known fact that the greatest wear on a side blown converter is on a plane immediately above the tuyeres. With this point in view the converter is separated through this plane, which is immediately above the trunnions. The bottom half carries the trunnions, which are cast with the ring which encircles the bottom half of the converter shell, the top of which is the dividing line of the two parts, and carries the top part of the converter. These are bolted together and firmly riveted to the shell. On the ring immediately over the wind box is bolted a heavy steel plate which prevents the slag and metal from clogging up the swing door on the wind box

while blowing. To this plate is attached a swinging cast iron frame carrying the oil burners, so that the latter fits into the tuyeres for heating the converter before blowing. On the top flange of the ring are six equidistant shackles, which swing through a slot provided for them. When the top is put in place these shackles swing into a slot of a bracket on top and a key is driven through the hole in the head of the shackle, thereby firmly securing both parts together. On the top half are four eye brackets through which are passed the chain hooks for lowering and lifting this part. There are also two trunnions bolted on this part, in line with the trunnions on the bottom half. Thus, when the top half is being cooled for repairs it sits on a special frame having two journals, which allows the top part to be swung around in any direction, so that repairing can be done quickly.

Immediately after the last blow the crane hooks are placed in the eye brackets and the top lifted off; and owing to a special refractory composition used in the joint the two parts separate easily and clean. The joint is as smooth as when put together at the beginning of the day's blowing. The top part is then placed in the frame and swung to cooling position, being sufficiently cool in two hours' time for repairing. It has been found

which is equivalent to the time necessary for the cupola man to have his cupola ready and blast on.

Fig. 1 shows the top being rammed up. The absence of forms of any kind is a conspicuous feature. It also shows where new gannister has been rammed in, showing the great wear on the dividing line. In Fig. 2 the bottom half is being rammed up. It demonstrates the easy accessibility of the tuyeres, thereby entirely eliminating the ramming in of new ones, as they are kept constant by daily repairing. In Fig. 3 a joint of special refractory material is being spread over the top of the lining. This is approximately 1 in. thick and of special composition, which insures a clean joint when the top is lifted off after blowing. Fig. 5 shows top part being lowered on the bottom half. The shackles can be seen entering into slots on the brackets on the top half.

At the Michigan Steel Casting Company's plant, Detroit, where this converter was designed and developed, there are three working, two of which have been in continuous operation for over two years, giving an average minimum output of 12 tons a day each. The capacity of blow is 1 ton. Both converters have produced up to date over 10,000 blows, and not once has a day been lost due to their not being ready for blowing. The metal is uni-



Fig. 3—Joint of Special Refractory Material Spread Over Top of Lining

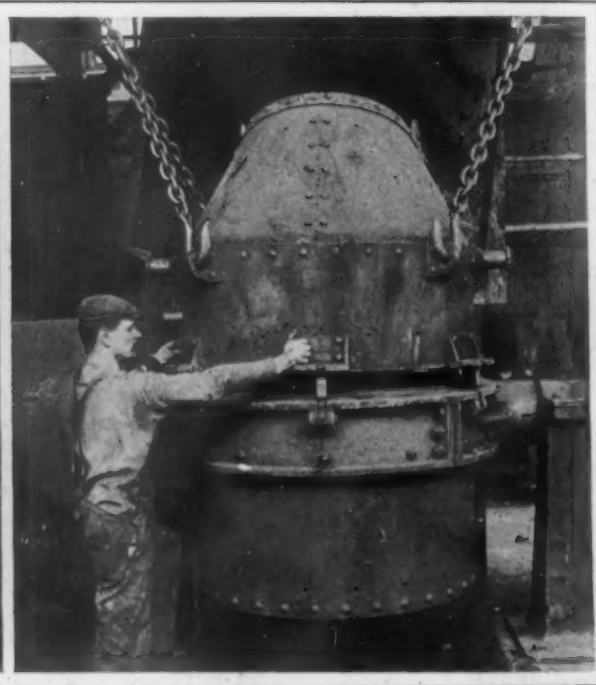


Fig. 4—Top Part Being Lowered on Bottom Half. Shackles Entering Slots on Brackets

in practice that the hotter it can be patched the better the lining resists the high temperature. The bottom half is then brought into a horizontal position, and the condition of the tuyeres and bottom are observed at once. This enables one to ascertain the condition of the converter within a few minutes after the last blow. Owing to its being repaired every morning the dimension lines are kept well defined, and all repairs can be carried out without the use of any forms, boards or special plates. Owing to the ease at getting to the converter a pneumatic rammer is used for ramming up the lining, so that maximum life is got out of it. The necessity of putting in new tuyeres is entirely eliminated, as they are rammed up every morning to the proper length. This is quite a feature, as the most difficult job in fixing converters is placing the tuyeres, since it is essential for them to be in the same plane to ensure good, clean ideal blowing. The lining in the bottom is rammed up to within 1 in. from the top. This allows space for refractory material used for making the joint. When the latter is made the top part is lifted by a crane swung over and lowered on the bottom half, the shackles are fixed into slots of brackets, the keys tightened, and the converter is turned over 75 deg. Then it is heated up and is ready for blowing by 9 a. m. The total time occupied by the converter man for repairing, closing and heating is only three hours,

form in analysis and temperature, and cannot be surpassed by that produced by other methods of melting, not excepting the electrical furnace, which so far has not demonstrated its claimed superiority for steel castings. The average time for blowing 1 ton is 11 minutes. The air going into the converter is at atmospheric temperature, as it has already been proved in practice that preheating the air does not reduce oxidation or time of blowing. This point is fully controlled by analysis of iron from the cupola, diameter of tuyeres, and the plane on which the air strikes the metal. By special fluxing in the cupola the sulphur does not exceed 0.05 per cent., the steel thereby meeting all requirements in chemical and physical tests. The average analysis of the metal is as follows: Silicon, 0.27 per cent.; phosphorus, 0.045 per cent.; sulphur, 0.05 per cent.; manganese, 0.75 per cent.; carbon, 0.20 per cent. The average physical test shown tensile strength of 76,990 lb.; elastic limit, 43,330 lb.; elongation on 2 in., 26.5 per cent.; reduction of area, 30.14 per cent.

The steel is poured directly from the converter into small ladles. The converter acts as a ladle, thereby keeping the metal hotter, and by the aid of a special core placed in its mouth the slag is kept from mixing with the metal when being poured into ladle. This converter is manufactured and sold by the Tropenas Converter Company, which has acquired the patent for the United States.

A Rolling Lift Bridge 186 Ft. Long

Details of a Bascule Type Structure
with a Concrete Counterweight

Attention has been attracted by the bascule bridge over the Calumet River, near South Chicago, Ill., along the line of the Chicago & Western Indiana Railroad Company, which is a terminal road for a number of lines entering Chicago, both by reason of the general design of the structure and its operating equipment. The bridge, which is of the Strauss design, is one of the longest single leaf spans in the world, being 186 ft. long from the trunnion to the end of the span. It is of the double track heel trunnion type and is exceeded only by the Baltimore & Ohio Railroad bridge over the same river, which is of similar design and has a movable span of 230 ft. The bridge weighs 1,100,000 lb., exclusive of the slag concrete counterweight, which weighs approximately 1500 tons. The length of the bridge, the size of the counterweight, the structure for supporting it and the electrical installation are features about the bridge that are especially worthy of mention.

As there was no available power within several miles of the site of the bridge, it became necessary for the railroad company to install its own plant. This was designed to possess sufficient capacity to handle the bridge economically at all times, with sufficient allowance to take care of another bridge, if four tracks should be installed. To reduce the size of the plant and still have power available at all times the use of a storage battery with a maximum output of 640 ampere hours was decided upon. At present only a portion of the battery space is filled with plates, the remaining ones to be added later as the conditions might require. The powerhouse, which is of fire-proof construction, is located on the right-of-way about 300 ft. from the bridge. It is divided into two distinct rooms, with separate entrances, the battery plant being located in one and the charging apparatus in the other. The floor of the house is on a level with the tracks, which are elevated at this point, an arrangement which gives an ample basement under the engine room.

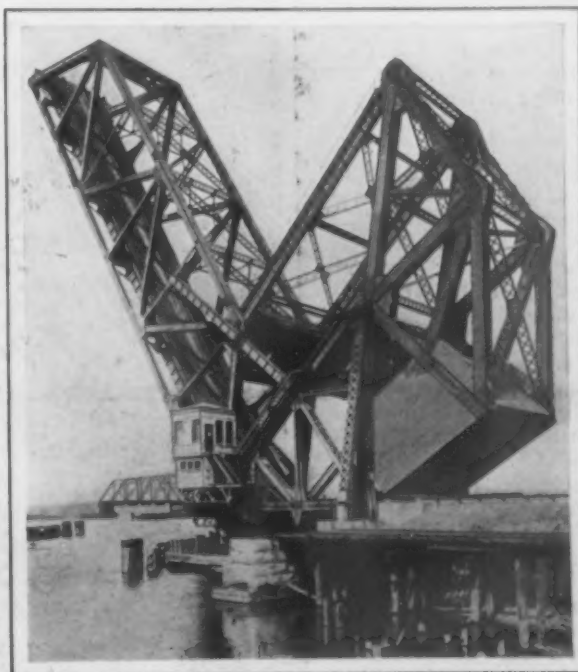
The Manchester type of plate of the Electric Storage Battery Company is used and the present installation is capable of raising and lowering the bridge 20 times without entirely exhausting the charge. The charging rate of the battery is 55 amperes and under the present conditions, it is charged twice a week for periods of 6 to 8 hr. The charging apparatus, which is installed in duplicate, consists of 30-hp. National Meter Company's gasoline engine, connected directly to a Roth dynamo and a 5-hp. outfit for a smaller battery, which is used for signal purposes, lighting the building and operating the auxiliary circuits on the automatic devices for the bridge operation and protection.

Cooling water for the engines is obtained from a cistern sunk below the level of the water of the river. The water is filtered through gravel to the cistern and is pumped by an electrically-driven house pump to a tank on the roof of the powerhouse. Separate circulating pumps are provided for each of the larger engines. An ample supply of fuel is obtained from a storage tank, having a capacity of 1000 gal. of gasoline, which is installed a short distance from the powerhouse. A compressed air plant, consisting of a direct-connected motor-driven compressor, having a capacity of 15 cu. ft., and storage tanks of 100 cu. ft. capacity have been installed in the basement to facilitate the starting of the engines and the furnishing of air to the bridge, the air being piped from the storage tanks to each engine and also to the bridge. A hot water heater which maintains a temperature of 60 deg. F. in the coldest weather is employed to heat the entire building, including the battery room and the basement.

From the switchboard in the powerhouse, the current is transmitted to the operator's house in underground lead covered cable. The motive power employed in lifting the span consists of two 65-hp. General Electric motors and an auxiliary 25-hp. motor. In raising the span, the two main motors are operated in series parallel, an arrangement which, when battery current is being used, has proved both economic and reliable, as maximum torque is exerted to raise the bridge from its seat with the two motors in series. The time of lifting varies from 1 to

11-13 min. with the large motors and when the auxiliary motor alone is used, the time is increased to 20 min. Under normal conditions, the starting current is 365 amperes at 220 volts, and this drops off as the resistance in the circuit is cut out. When the motors are thrown from the series operating position to the parallel one, the current rises to a maximum value of 400 amperes and falls off gradually to 300, until the bridge runs into the automatic stop and the brakes are applied. The current for raising the bridge off its seat with only one motor is 500 amperes. Both of the large motors and the 4-hp. one operating the bridge lock are equipped with solenoid brakes, with an airbrake on the first reduction shaft of the lifting machinery and the necessary valves. This was one of the first bridge installations where air was used for braking purposes, but it has been found very effective and will hold the bridge in any position.

All of the motors are electrically interlocked, thus preventing the operator from performing an operation out of its proper sequence. Until the lock motor has withdrawn the bridge lock and come to rest, it is impossible for the span raising motors to receive current, and in lowering the bridge, the lock motor is inoperative until the



The Bridge of the Chicago & Western Indiana Railroad Over the Calumet River. This Structure is One of the Largest of Its Kind, and Is Operated by Electric Motors

large motors have come to rest and the bridge is seated. A contact switch on the end of the bridge closes the circuit only when the structure is within 1 in. of its seat and also furnishes a double protection. When the bridge has reached a predetermined point in its upward travel, the current to the main motors is automatically cut off and it is impossible to lift the structure any higher. When the bridge reaches this position, reversing the controller handle makes it possible to reverse the lifting motors and lower the bridge. No automatic stops are installed on the nearly closed position of the bridge, the closing being left entirely to the operator.

The electrical control of the bridge is interlocked with the railroad signal system so that it is impossible for the controllers to permit the motors to receive current until the proper danger signals have been set and the master lever of the signal interlocking stand withdrawn. This last operation gives current to the contactors of the bridge equipment and the very first operation of the bridge devices locks the master lever, thus preventing the signals from being thrown to the clear position. These signals are not released until the bridge has been entirely locked up and the master lever released.

The complete electrical equipment, including the design, of the powerhouse, was furnished by C. H. Norwood, contracting engineer, Chicago, Ill.

James Gayley Receives the Perkin Gold Medal

Honor Conferred by Chemical Societies
in Recognition of Valuable Service to
Industry in Perfecting Dry Air Blast

In recognition of his contribution to metallurgical chemistry through his invention of a method and apparatus for dry air blast in connection with the operation of blast furnaces, James Gayley, formerly first vice-president of the United States Steel Corporation, was presented with the Perkin Gold Medal at Rumford Hall, 50 East Forty-first street, New York, on the evening of January 24. The medal was founded in 1906 by a number of chemists in commemoration of the fiftieth anniversary of the coal tar color industry, and was awarded first to Sir William H. Perkin in that year for his discovery of mauve. It is awarded annually for the most valuable work in applied chemistry, and according to the rules governing the award may be given only to chemists residing in the United States. The medal was presented to Mr. Gayley by Prof. Charles F. Chandler, senior American past president of the Society of Chemical Industry, an international organization with headquarters in London, on behalf of the Perkin medal committee of the Associated Chemical and Electrochemical Societies of America.

The occasion of the presentation was the January meeting of the New York section of the Society of Chemical Industry. Prof. M. C. Whitaker, Columbia University, chairman of the local section of the society, presided over the meeting and after brief introductory remarks presented Professor Chandler, who gave a sketch of Mr. Gayley's career, particularly dwelling on his achievement in industrial chemistry.

Mr. Gayley's Professional Work

Professor Chandler said:

"This medal has been awarded to Mr. Gayley by the Perkin Medal Committee of the Associated Chemical and Electrochemical Societies of America in recognition of his most valuable work in chemical metallurgy.

"James Gayley is the maternal grand nephew of Sir Henry Bell, who established steam navigation on the Clyde, where he launched the Comet in 1812. He was born at Lock Haven, Pa., October 11, 1855, the son of Samuel A. and Agnes (Malcolm) Gayley. He was educated at West Nottingham Academy, Md., and graduated from Lafayette College in 1876 with the degree of mining engineer. In 1906 he received from the University of Pennsylvania the honorary degree of doctor of science, and in 1912 the same degree from Lehigh University. In 1908 he received the Elliot Cresson Gold Medal for the Promotion of the Mechanic Arts from the Franklin Institute.

"Mr. Gayley began his professional life as chemist for the Crane Iron Company, Catasauqua, Pa., 1877-80. He was next superintendent of the Missouri Furnace Com-

pany, St. Louis, and later was the manager of the blast furnaces of the E. & G. Brooke Company, Birdsboro, Pa., 1880-85. In 1885 he became manager of the blast furnaces at the Edgar Thomson works, and he was subsequently promoted to the position of manager of the Edgar Thomson Works, and he later became a director of the Carnegie Steel Company. In 1901 he was made first vice-president of the U. S. Steel Corporation, remaining in this position until 1909. He was the inventor

of furnace improvements, bronze cooling plates, stand for ladle in pouring Bessemer heats and the dry air blast.

"Were it not that we have with us tonight Mr. Gayley himself, it would be my duty and pleasure to give you a history of his various most valuable contributions to metallurgical chemistry. But as you would certainly prefer to learn this from his own lips, I will content myself with saying that I cannot recall a more far-reaching invention than that of the dry air blast for the manufacture of iron, for which he received, between October 23, 1894, and September 5, 1911, no less than 15 successive patents in this country. I am told that his results in this direction alone mean a reduction of at least \$1 per ton in the cost of producing pig iron besides making it possible for the iron master to produce in all weathers a product of uniform quality. When one remembers that there were produced in the United

States in the past year 29,000,000 tons of pig iron, it will be seen that this, Mr. Gayley's invention of the dry blast, would mean a saving to the American people of \$29,000,000 per annum.

"I have presented to you very briefly the great achievements of Mr. Gayley in the field of applied chemistry, but quite fully enough to satisfy you that your Committee is fully justified in placing Mr. Gayley by the side of Sir William Perkin and the previous recipients of the Perkin Medal, as one of our greatest industrial chemists and chemical engineers. Mr. Gayley, it gives me great pleasure, as the representative of the Society of Chemical Industry, and the affiliated chemical and electrochemical societies, to place in your hands this beautiful token of the appreciation and affection of your fellow chemists."

Mr. Gayley's Response

In acknowledgement of the honor bestowed upon him, Mr. Gayley had prepared an extensive account of the many experiments which preceded success in the working out of the dry air blast. In expressing his appreciation he remarked that the awarding committee "had stepped aside from what is purely a chemical industry to another great industry, that of metallurgy, which, nevertheless, is one in which the application of chemistry is the controlling factor." He added that "this recognition of the



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JAMES GAYLEY

broader field of chemistry brings with it a keen sense of appreciation of the rare honor and distinction conferred upon it."

EXPERIMENTS IN ENGLAND

Speaking of the early recognition of moisture in the atmosphere as a variable element in the manufacture of iron, Mr. Gayley said that in England it was proposed to extract the moisture by passing the air over lumps of chloride of calcium; but Sir Lowthian Bell showed the impracticability of that scheme, on account of the rapidly diminishing power of absorption of calcium chloride. Charles Cochrane, an eminent British iron manufacturer, obtained a patent on a method of extracting moisture from the air, but later decided that the game was not worth the candle. Mr. Gayley made the point that few blast furnace men realized that the weight of air consumed per ton of iron is 50 per cent. greater than that of all the other raw materials combined. In other words, it requires about 4 tons of ore, coke and limestone to produce a ton of pig iron, while 6 tons of the atmosphere is required. The necessity of working out data, apart from all that had been accumulated by refrigerating firms, arose from the fact that while the latter readily understood refrigerating the air for cold storage rooms the treatment of a hurricane of air was an entirely different problem to them. Among other experiments Mr. Gayley tried rarefaction with refrigeration, but did not obtain satisfactory results.

There was no small difficulty in getting the appropriation of \$100,000 asked for to build the refrigerating apparatus at Isabella furnaces. Not until 1903 was an appropriation secured, though Mr. Gayley had offered two years before to assume personally half the expense. Some of the results secured were detailed, as given in Mr. Gayley's original paper of October 26, 1904, before the New York meeting of the Iron and Steel Institute. Applause greeted the exhibition of a wall chart, a reproduction of the one given in *The Iron Age* of February 2, 1911, showing the variability of moisture in natural air and the regularity of dry air. The records obtained at several works from the use of dry air and which in each case covered a considerable period were cited as follows, the differences being due to different raw materials and to the personal equation of management:

Works A obtained a decrease in coke consumption of 10.5 per cent. and an increase in output of 23 per cent.

Works B obtained a decrease in coke consumption of 6 per cent. and an increase in output of 15.3 per cent.

Works C obtained a decrease in coke consumption of 9.8 per cent. and an increase in output of 11.8 per cent.

Works D obtained a decrease in coke consumption of 10.5 per cent. and an increase in output of 16 per cent.

Mr. Gayley only referred in passing to the theories advanced to account for the fuel saving, which had been found to be in excess of what is necessary to dissociate the moisture. The names of Prof. Henry M. Howe, Prof. J. W. Richards and J. E. Johnson, Jr., were mentioned among those who had ably discussed this phase of the subject. In conclusion Mr. Gayley said:

AIR BLAST AND OTHER DISCOVERIES

"Toward a full consideration of the dry air blast, a few points may be referred to briefly:

"It did not come into its work as did the Nielson hot blast in 1828, when the art was crude and the appliances of the furnace were poorly adapted to the work. Yet to the Scotchman Nielson all credit is due for effecting a fuel saving of 30 per cent.

"The dry air blast was tried out when the equipment of the furnace was as perfect as human skill could make it. The chemistry of furnace operations was well understood, and its management was on a skillful and scientific basis."

"Again, it was not possible for dry air blast to have an experimental stage. Nearly every device or process can be tested in an experimental way, and on a comparatively inexpensive scale. Bessemer could blow air through molten metal in a pot and demonstrate the value of the pneumatic process, but it would have been of no value to build a small plant to refrigerate a part of the air; nothing conclusive would have been shown. Nor would it have been of any value to treat the whole air supply of a diminutive or toy furnace. To efficiently demonstrate its value it had to be applied to a furnace that was equipped

and operated according to the most advanced state of the art, and not only was it essential that the whole air supply should be treated, but also that the method and means of treatment should measure up in capacity and efficiency, and operate as continuously as any of the other accessories of a modern blast furnace. To achieve this it required time, patience and many experiments; and now with its accomplishment in removing irregularity from the most important and variable factor in the winning of iron from its ores it apparently removes the last barrier to the attainment of ultimate economy in the present field of practice."

Tributes to Mr. Gayley and His Process

Prof. Henry M. Howe followed Mr. Gayley with an address which dwelt upon the dry air blast and its great benefit to the iron industry. He opened his remarks by saying: "Interesting as are the other aspects of the Gayley process, the greatest interest lies, I think, in the light which it throws on the matter of expert evidence and on the value of expert opinion." Of the blast furnace, Professor Howe said: "Like every mundane process that seems simple it is in fact of a complexity so overwhelming that the human mind is inherently and incurably impotent to grasp it. We rub our eyes and, seeing as far as the end of our noses, assume that we see to the end of the universe." After relating the advantages that followed the introduction of the Gayley process, Dr. Howe alluded to those who were at first skeptical of the saving gained by refrigeration of the air blast in these words: "Its preposterousness was promptly and convincingly exposed by the public spirited experts who were prevented geographically from knowing Mr. Gayley's character."

Prof. Edward Hart of Lafayette College, Easton, Pa., of which Mr. Gayley is a trustee and to which he gave the Gayley Chemical and Metallurgical Laboratory, gave several reminiscences of a personal character, especially concerning Mr. Gayley's early days at Lafayette, and spoke with appreciation of the time and money which Mr. Gayley had given to the institution. Dr. Rossiter W. Raymond, secretary emeritus of the American Institute of Mining Engineers, also gave an address, in which he touched upon Mr. Gayley's achievements and his college days.

Recipients of the Medal

Since the founding of the Perkin Medal it has been received by the following in preceding years: Sir William H. Perkin, J. B. F. Herreshoff, for services rendered to the chemical industries of the United States; Arno Behr, for services rendered the corn products industry; Edward G. Acheson, for general work in electro chemistry, particularly the production of graphite and abrasives in the electric furnace; Charles M. Hall, for the discovery of commercially valuable processes for the manufacture of aluminum; Herman Frasch, for the desulphurizing of Ohio petroleum and the development of the process and mining of sulphur in Louisiana. The presentation to Mr. Gayley was attended by President James A. Farrell, of the United States Steel Corporation, and other officials of large corporations, about 300 persons being present. Prior to the meeting an informal dinner was held at the Chemists' Club, 52 East Forty-first street. A full report of the proceedings has been forwarded to England by Dr. Parker C. McIlhenny, secretary of the New York section of the society, and will be published in the journal of the Society of Chemical Industry.

The Eagle Claw Wrench Company, Chicago, is the manufacturer and its president the inventor of the Eagle Claw wrench for pipe and round head bolts, described in *The Iron Age* of December 5, 1912. Ambler, Holman & Co., Chicago, are distributors in the United States and Canada.

Thomas E. Pigott has opened a steel warehouse at 632 Frankfort avenue, Cleveland. He will handle cold rolled strip steel made by the Morris & Bailey Steel Company, Pittsburgh, open-hearth steel bars, polished cold drawn bars and some other products. He will make a specialty of cutting material to lengths.

New Grinding and Polishing Machines

Gardner Products Notable for an
Extensive Use of Ball Bearings

Ball bearings are now being used extensively by the Gardner Machine Company, Beloit, Wis., in the disk grinding and polishing machines which it builds. This has been done as the result of extensive tests made by the company, for the purpose of comparing ball bearings with the other types ordinarily used. These tests showed that less power was required for equal results in all cases, the saving being most marked in the motor-driven grinding machines and the different types of polishing lathes. Fig. 1 shows a disk grinding machine with motor drive, and Fig. 2 illustrates the floor type of ball bearing polishing lathe. Views of two styles of belt-driven disk grinding machines are given in Figs. 3 and 4, being the patternmaker's machine and a machine with underbelt drive, respectively.

The No. 4 motor-driven grinding machine shown in Fig. 1 is driven by a fully inclosed 5-hp. alternating-current motor. This is equipped with special end yokes and is fitted with radial and thrust ball bearings. The equipment shown in the engraving includes a right hand universal lever feed table and left hand plain table with squaring gauge and two 23-in. disk wheels.

The special features characterizing the No. 3 floor

type polishing lathe illustrated in Fig. 2 are the extra large dimensions of the spindle and the rigid construction throughout. This machine is shown arranged for underbelt drive, but by removing the shield it is possible to belt it to an overhead countershaft.

The No. 18 patternmaker's disk grinding machine shown in Fig. 3 is fitted with both ball radial and thrust bearings. It is regularly furnished with two 30-in. disk wheels which are faced with a special grade of garnet paper.

The No. 2 grinding machine illustrated in Fig. 4 is arranged for underbelt drive and is fitted with ball radial and thrust bearings. The spindle pulley is covered by a shield and the belt passes down through the base of the machine to a countershaft fastened to the ceiling of the floor below. The disk wheels of this machine are 18 in. in diameter. Like the motor-driven machine shown in Fig. 1, this one is equipped with universal lever feed and plain tables. The full equipment of this machine includes a wheel press for setting up the grinding wheel and a countershaft.

In addition to these ball bearing machines the company is prepared to furnish ball bearing countershafts for any of its machines and practically all of the disk grinding machines can be equipped with ball bearing motor drives.

One of the interesting points brought out in the tests made by the company was that after the power had been shut off from any of the machines equipped with ball

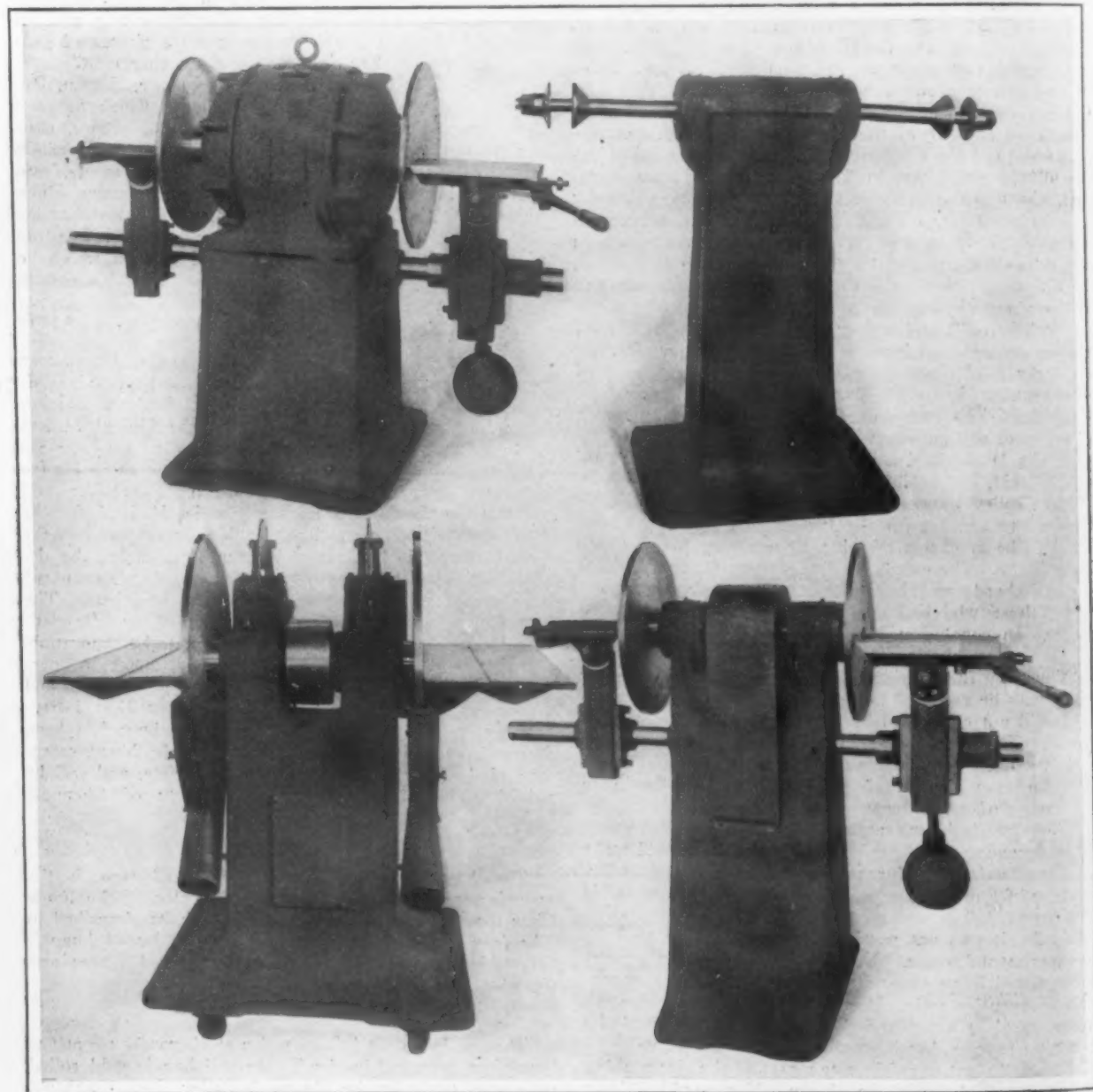


Fig. 1—No. 4 Motor-Driven Grinding Machine
Fig. 3—No. 18 Patternmakers' Disk Grinding Machine

Fig. 2—No. 3 Floor Type Polishing Lathe
Fig. 4—No. 2 Grinding Machine with Under Belt Drive

Some of the New Ball Bearing Disk Grinding and Polishing Machines Built by the Gardner Machine Company, Beloit, Wis.

besides, the spindle and the disk wheels continued to revolve for from 8 to 10 min. In actual practice this movement is, of course, overcome by forcing the work which is being ground against the wheel.

Canadian Production of Iron Ore and Pig Iron

The last publication of the Department of Mines of Canada, issued late in 1912, deals in part with the iron industry. The total shipments of iron ore from Canadian mines in 1911 are reported at 210,344 net tons, against 259,418 tons in 1910. The shipments from the Wabana mines, Newfoundland, in 1911, by the two Canadian companies operating there, were 1,189,463 net tons, of which 765,184 tons was shipped to Sydney, Nova Scotia, and 416,579 tons to the United States and Europe. The total production of pig iron in Canadian blast furnaces in 1911 was 917,535 net tons against 800,797 tons in 1910. The amount of Canadian ore used in 1911 was 67,434 tons; of imported ore, 1,628,368 tons; of mill cinder, 30,298 tons. The amount of coke used was 1,121,321 tons, of which 543,933 tons was from Canadian coal and 577,388 tons was imported coke or coke made from imported coal. In blast furnace operations 1,778 men were employed and their wages were \$1,097,355. The exports of pig iron for the year are reported at 5870 tons, valued at \$1,271,968 tons, an average of \$46.33 per ton. It is pointed out that the greater part of this was ferrosilicon and ferrophosphorus, produced at Welland and Buckingham, respectively. Pig iron imports for the year were 208,487 tons, valued at \$2,610,989. Of ferromanganese, the imports were 17,226 tons, valued at \$429,465.

Reference is made to continued investigations of the iron ore deposits in territory tributary to the Central Ontario Railroad in the counties of Hastings and Peterborough. All the ore bodies examined are a concentrating proposition and the results of the small operations carried on intermittently at these mines for a good many years are spoken of as rather disappointing.

The report deals briefly with the recent developments of electro-metallurgy. The work done with a 2500 hp. electric furnace for iron smelting at Trollhättan, Sweden, is described and the results are referred to as indicating that the electric production of pig iron will in the near future supersede charcoal furnaces in Sweden. Eight Grönwall reduction furnaces with an aggregate of 25,000 hp. are in operation or in course of construction. In addition, furnaces with an aggregate of 36,000 hp. are projected. Dr. Eugene Haanel, director of the Department of Mines, who reported at length on electric smelting in Sweden three years ago, says in the present report that the conditions affecting the production of iron and steel in certain parts of Canada resemble those of Norway and Sweden, suggesting that Canada should find special interest in the study of the results with electric furnaces in Scandinavia.

James Stewart & Co.'s Operations

The Canadian Stewart Company, Ltd., was contractor for the larger part of the work in the building of the new Canadian Pacific coal handling plant described in *The Iron Age* of January 16. This is the Canadian branch of James Stewart & Co., engineers and contractors, whose general offices are located in the Hudson Terminal Building, New York City.

This contracting firm has just been incorporated under the name of James Stewart & Co., Inc., with a capital stock of \$3,750,000. It will have \$1,000,000 of 7 per cent. cumulative preferred stock; \$1,500,000 of 7 per cent. cumulative second preferred and participating, and \$1,250,000 of common. The statement is made that there will be no public offering of the shares. A. M. Stewart will be president; James C. Stewart, vice-president; Henry F. Lehmann, second vice-president and Western manager; Charles F. Transom, third vice-president and chief engineer; W. A. Rowan, treasurer, and J. B. A. Fothergill, secretary.

The firm was formed in 1845 in Ottawa, Canada. In 1865 the general offices were moved to St. Louis, and 10 years ago were transferred to New York City. It is one of the oldest contracting firms in the country.

The Mongen Drier for Molds

What is known as the Mongen preheater for the drying of molds in foundries has been brought out by a German engineer. Its construction and operation are made

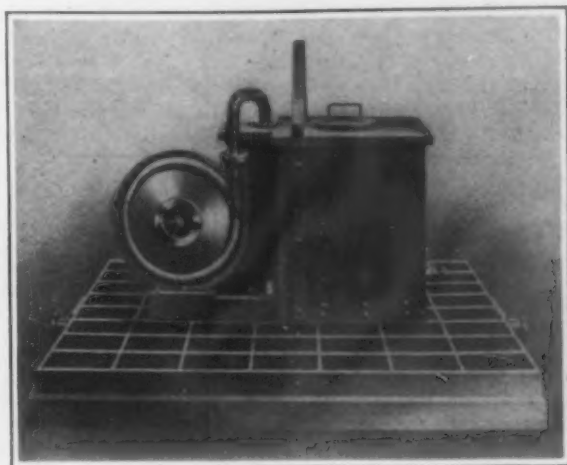


Fig. 1—The Mongen Preheater for Mold Drying

clear by the illustrations given below. The construction differs from that of other mold-drying furnaces in that there is the direct passage of the blast into a tuyere having a funnel-shaped opening. The blast then mixes with the gases of combustion drawn by a siphon arrangement from a coke furnace. The proportions of air and gases are regulated by the size of the nozzles used and the temperature can be kept from exceeding 450 deg. C., or 842 deg. F., thus guarding against the burning of the molds. The illustrations show the method employed, and the relation of the ventilator, the blast pipe, the coke chamber and the nozzles. The blast does not pass through the coke. There are no dampers or regulators and therefore molds cannot be burned through carelessness or design. The siphon suction is slight and thus the drawing of particles of ash into the molds is avoided, a point of some importance where molds are inaccessible after drying.

The charge of coke is about 70 lb. and after the fire is started the furnace need have no attention for two

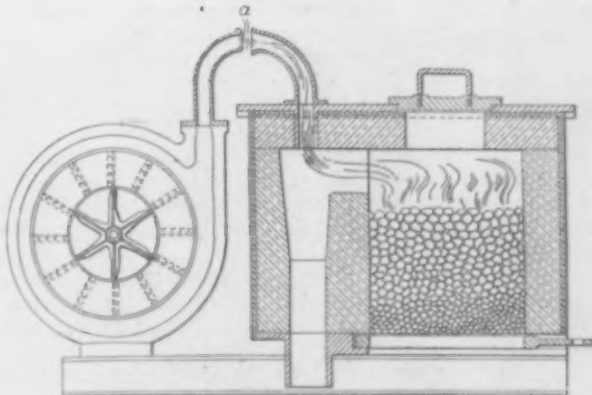
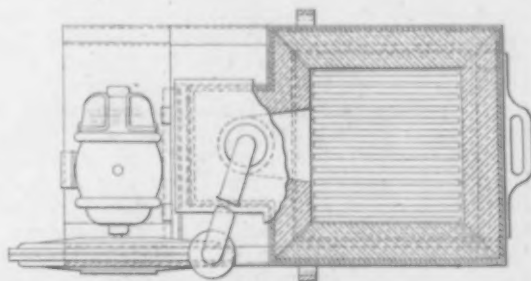


Fig. 2—Plan and Section of the Preheater

hours. In recharging, the air is drawn in through the charging door, and there is no escape of ashes or gas. Complete combustion of carbon to carbonic acid is claimed

and hence poisonous gases are not produced. There is very strict government inspection in Germany, but it is stated that the preheater is run freely during working hours. The motor and ventilator are secured against flarebacks in case of interruption of electrical current by the provision of the nozzle *a* in Fig. 2.

The furnace is discharged by pulling out the grate, which is a one piece casting. The lining is fire brick slabs 4 in. thick, and there is asbestos insulation $\frac{3}{4}$ in. thick to prevent radiation losses. The weight of the stove is about 1650 lb. The motor if housed is 1 hp.; if open $1\frac{1}{2}$ hp. The estimate of cost of mold drying by using the preheater is $7\frac{1}{2}$ to 20c. a ton.

The World's Output of Electric Steel

Records of Five Leading Countries
—Only a Small Increase in 1911

The world's production of steel ingots and castings by the electric process is reported by the Comité des Forges de France as having amounted to 126,476 tons in 1911, as compared with 120,116 tons in 1910 and 47,039 tons in 1909. Kershaw estimates the output in 1908 at about 30,000 tons. The French Association prints a table giving the annual output by Germany and Luxemburg, the United States, Austria and Hungary, and France from 1909 to 1911 inclusive. This table, however, is not complete, as the production of electric steel by Sweden in the three years is not included. Nor does the association include the output of electric steel by Italy, Great Britain, Norway and Switzerland, all four of which made steel by this process in recent years. In addition, Spain, Belgium, Russia, Mexico and Japan are reported to have been looking into the merits of the electric process for making steel and some of these countries may have also produced small quantities of electric steel in 1911 and perhaps in some earlier years.

Italy has made steel by the electric process regularly since 1903. In 1911 there were 4 electric furnaces in operation in that country, as compared with 2 furnaces in 1910 and 5 furnaces in 1909. At least small quantities of steel by the electric process were therefore made in all three years. No figures for any year seem to be available, however.

Great Britain also made considerable quantities of electric steel in 1911, and perhaps in some earlier years. A 2-ton Heroult furnace has been in operation for some time at Baintree making steel castings for automobiles. Electric furnaces are also being operated at Sheffield by Verdon Cutts & Hoults, the Edgar Allen Company, John Brown & Co., William Jessop & Sons, Vickers' Sons & Maxim, and Thomas Firth & Sons. While the furnaces operated by these companies are all of small capacity, their product being chiefly steel of a special character for tools, etc., their united output would probably amount to several thousand tons annually. At Carlin How in Yorkshire a 15-ton Heroult furnace is being built, which will, it is said, manufacture steel for rails and will considerably increase the annual output of electric steel. The Stobie Steel Company, Sheffield, is now erecting a plant there, which is being equipped with 5 electric steel furnaces—two 15-ton, two 5-ton, and one 3-cwt., the latter to be used as an alloy melting furnace. Some of the electric furnaces in Great Britain use molten metal from open hearth furnaces, while others make steel from cold scrap. Statistics of the production of Bessemer and open-hearth steel ingots and castings only are annually collected in the United Kingdom, the manufacturers declining to report to the British Iron Trade Association their annual output of crucible and electric steel ingots and castings.

In Sweden in 1911 there were 13 electric furnaces in operation, as compared with 12 in 1910 and 11 in 1909. The production of these furnaces in 1909, 1910 and 1911 will be found in the table given below.

Norway has made steel by the electric process since early in 1910, a 5-ton furnace having been put in operation at Jossingfjord in the spring of that year. It is reported that a 30-ton furnace is now being added.

Germany first reported the manufacture of electric steel in 1908, in which year the output was 19,536 metric tons. As shown by the table, the production of steel by the electric process in Germany in 1911 amounted to almost

one-half of the total output reported for the world. The number of furnaces that made electric steel in Germany in 1911 was 15, as compared with 13 in 1910 and 8 in both 1909 and 1908.

France has also reported the manufacture of electric steel since 1908, in which year the quantity was 2688 metric tons. For 1911 the number of active electric furnaces is not available, but in 1910 there were 21 furnaces in operation, against 12 in 1909 and 7 in 1908. In the first six months of 1912 France made 7920 tons.

Austria first reported the manufacture of electric steel in 1908, when 4333 metric tons were made. In 1909 the output was 9048 tons; in 1910 it was 19,672 tons, and in 1911, 21,606 tons. Hungary appeared as a maker of electric steel for the first time in 1910, when 356 metric tons were reported. In 1911 the output was 1261 tons. The number of electric furnaces active in Austria and Hungary in these years is not available. A 2000-kg electric furnace is now being installed at the Königliche Ungarische Staatseisenwerke, at Diosgyor, Hungary.

Switzerland has also been manufacturing steel by the electric process for some time. It has one furnace of about 2 tons capacity.

In the United States steel by the electric process was first produced in 1908, the output amounting to 55 tons, made by one plant. There is likely to be a considerable increase in production in the near future, although in the first half of 1912 the output is reported by the American Iron and Steel Institute at only 6882 tons, a surprisingly small total. At the present time 14 plants in the United States are equipped with electric furnaces. In addition 5 plants are now installing electric furnaces or have placed contracts for their installation. The number of works that made electric steel in 1911 was 9, against 7 in 1910, 4 in 1909, and 1 in 1908.

The table which the Comité des Forges de France has compiled is given below. The output of electric steel in Sweden for the three years has been added. Gross tons are used for the United States and metric tons for all foreign countries.

	1909 Tons	1910 Tons	1911 Tons
Germany and Luxemburg.....	17,773	36,188	60,654
Austria-Hungary	9,048	20,028	22,867
United States	13,762	52,141	29,105
France	6,515	13,445	13,850
Sweden	591	431	2,034
Total	47,689	122,233	128,510

With the exception of the United States, all the countries named in the table show an encouraging growth in the three years. In this country the output in 1911 fell off from that of 1910 by over 44 per cent. Germany, on the other hand, shows an increase of 24,466 tons, or over 67 per cent.

Of the total production of electric steel in the United States in 1911 about 27,227 tons were ingots and about 1878 tons castings. Almost all such steel made in this country is taken to the electric furnaces in a molten condition from Bessemer converters, open-hearth furnaces or crucible furnaces. On the Continent, however, and to some extent in Great Britain, cold metal is usually charged in the furnaces and melted by electricity. Of the 29,105 tons of electric steel made in the United States in 1911 over 6700 tons were alloy steel. In the same year 462 tons of rails were rolled from electric steel.

The Ohio Public Service Board has granted authority to the Lake Erie & Youngstown Railroad to issue \$9,000,000 in bonds and stock for building a railroad between Conneaut and Youngstown, Ohio, a distance of 65 miles. The proposed railroad is designed largely for hauling coal to Lake Erie and ore from Conneaut to the Mahoning Valley. The company plans the erection of one roundhouse at Conneaut and another at Youngstown. It is reported that the company intends to handle freight traffic with steam locomotives and passenger traffic with gasoline motor cars.

The Portsmouth Steel Company, Portsmouth, Ohio, has made arrangements for moving its offices from the works to the sixth floor of the new First National Bank Building, recently erected at Portsmouth.

The New York Automobile Show

The thirteenth National Automobile Show, held in the Grand Central Palace and Madison Square Garden, New York, January 11 to 25, was the largest ever held in New York City, not only as to size, but also in regard to attendance and interest. The first week was devoted to pleasure cars and the second to commercial vehicles, with parts and accessories on display throughout the two weeks. The exhibits in both buildings were parallel in character. There were in all 702 displays housed. In the first week 42 makes of pleasure cars were shown in the Garden and 46 in the Grand Central Palace, the lowest priced car being one at \$895 and the highest at \$7,300. At the Palace 23 companies exhibited motor cycles. In the second week there were 25 displays of commercial vehicles in the Garden and 40 in the Palace.

The estimated cost of all the exhibits was \$5,500,000, and the estimated attendance 400,000. In both buildings the exposition space totaled 275,000 ft. The big task of preparing the Garden for the show may be judged from a consideration of materials used. In the Garden 200 tons of metal and 1,000,000 ft. of lumber were required. In the wall paneling of the same building 5000 sq. ft. of mirrors was used, while the structural work was covered by 5400 yards of fireproof azure fabric, all being illuminated with 7700 tungsten incandescent lamps. It is estimated that fully half of the cars shown were equipped with electric starting and lighting systems.

Attendance was not so great in the week devoted to trucks as it had been in the pleasure car week, but the second week was declared to be excellent from a buyer's standpoint, as better opportunity for inspection and discussion was had. The number of visitors from the West and South was notable.

Motor Truck Exhibits

The International Motor Company, New York, exhibited a New York fire department combination chemical and hose wagon of Mack design, a 5-ton Saurer truck with low body, a 6½-ton Saurer chassis, 2-ton Mack express wagon with steel body, a new 1500 to 2000 lb. light delivery truck called the International, a 4-ton Mack truck with moving van body, a 7½-ton Mack truck with automatic power dump, suitable for gravel, coal, asphalt, etc., a 1-ton Mack delivery wagon, a 10-ton Hewitt truck built for the transportation of milk. A novel feature of the International exhibit was a truck having for a body a huge reproduction of an Atlas Portland cement barrel, which is to be used in service, principally for the collection of cement bags.

The Velie Electric Motor Company, Moline, Ill., showed 1, 2, and 3-ton trucks, particular interest being taken in a 2-ton truck with standard stake body, built for Thomas W. Kiley & Co., iron and steel, Brooklyn, N. Y.

The Kissel Motor Car Company, Hartford, Wis., showed a 2500-lb. heavy delivery car with several new features, one of which is a speed regulation which operates on the speed of the car and not that of the motor. Also shown by this company were a 1500-lb. delivery car, a 3-ton truck with stake body, 4-ton with dumping body and a 5-ton chassis.

Accessories Shown

The exhibit of accessories and parts was extremely large and its interest was added to by novel arrangements of displays or ingenious devices for demonstration. Among the manufacturers showing their products were: The American Metal Hose Company, Waterbury, Conn.; Baldwin Chain & Mfg. Company, Worcester, Mass.; Baldwin Steel Company, New York; Carnegie Steel Company, Pittsburgh, Pa.; Chicago Drop Forge & Foundry Company, Chicago; Cleveland Hardware Company, Cleveland, Ohio; Coes Wrench Company, New York; Corbin Screw Corporation, New Britain, Conn.; William Cramp & Sons Ship & Engine Building Company, Philadelphia, Pa.; Diamond Chain & Mfg. Company, Indianapolis, Ind.; Joseph Dixon Crucible Company, Jersey City, N. J.; General Electric Company, Schenectady, N. Y.; Globe Machine & Stamping Company, Cleveland, Ohio; B. F. Goodrich Company, Akron, Ohio; Hartford Machine Screw Company, Hartford, Conn.; Hess-Bright Mfg. Company, Philadelphia, Pa.; Hyatt Roller Bearing Company, Harrison, N. J.; Ingersoll-

Rand Company, New York; Janney, Steinmetz & Co., Philadelphia, Pa.; Link-Belt Company, Philadelphia, Pa.; Frank Mossberg Company, Attleboro, Mass.; National Tube Company, Pittsburgh, Pa.; New Departure Mfg. Company, Bristol, Conn.; Thomas Prosser & Son, New York; Rhineland Machine Works Company, New York; S. K. F. Ball Bearing Company, New York; F. W. Spacke Machine Company, Indianapolis, Ind.; Standard Roller Bearing Company, Newark, N. J.; Standard Welding Company, Cleveland, Ohio; Standard Thermometer Company, Philadelphia, Pa.; Veeder Mfg. Company, Hartford, Conn.; Wells Bros. Co., Greenfield, Mass.; Whitney Mfg. Company, Hartford, Conn.; J. H. Williams & Co., Brooklyn, N. Y.; Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.

Machine Tool Display

The idea of exhibiting machine tools was conceived at too late a day to permit of the assembling of a large number of exhibits, and this feature of the truck show week was smaller than had been hoped for, but what was shown was excellently arranged and in most cases tools were demonstrated in actual operation. The exhibit occupied a section of the basement in Madison Square Garden.

A 36-in. vertical turret lathe of the New Era type, which was shown by the Bullard Machine Tool Company, Bridgeport, Conn., excited many favorable expressions of opinion. It was demonstrated machining steel truck wheels 12 x 34 in. On similar work in the factory this machine has maintained an average of three hours per wheel on a lot of 400.

The Potter & Johnson Machine Company, Pawtucket, R. I., showed in operation two 6A. automatic chucking and turning machines, a 15-in. universal shaper and a No. 4 manufacturing lathe.

The Garvin Machine Company, New York, had an exhibit of 24 tools, including a new automatic machine for cutting oil grooves in half boxes, solid boxes, bushings and bearing brackets. It cuts straight or spiral grooves, right or left hand, and is also applicable for key-seating. A feature of the Garvin exhibit which attracted especial attention from those not versed in mechanics, as well as those who are, was the operation of an automatic index chuck which can be changed while in operation, so presenting a new surface or part for the cutting tools contained in a turret. Other items in the Garvin exhibit were milling machines, hole grinding machine, screw machine, cam cutter and hand miller.

The Fairbanks Company, New York, exhibited a Fox No. 2 multiple spindle drill, manufactured by the Fox Machine Company, Grand Rapids, Mich., and Seneca Falls and Star lathes. The Lees-Bradner Company, Cleveland, Ohio, showed spiral gears, and the Cleveland Worm & Gear Company, Cleveland, exhibited worms of Ubas (Sheffield) steel and worm gears of phosphor bronze. The products are made on imported machines. The Bausch Machine Tool Company, Springfield, Mass., showed a multiple spindle drill. Other exhibitors were the Hisey Wolf Machine Company, New York, and S. S. Eveland, Philadelphia, Pa.

General Electric Sheet Mill Equipment

The Carnegie Steel Company will install in its Edgar Thomson steel works at Bessemer, Pa., a 3500 kw. Curtis turbo-generator. The Brier Hill Steel Company, Youngstown, Ohio, has arranged to add to its power plant equipment two 1000 kw. Curtis turbo-generator units with 35 kw. motor-generator exciter sets. For electric drive throughout the mills 121 motors ranging from 3 to 150 hp. will be installed. The John A. Roebling's Sons Company, Trenton, N. J., will add to its power plant equipment a 500 kw. Curtis turbo-generator unit with switchboard. The Pittsburgh Crucible Steel Company will install in its mills at Midland, Pa., four 500 kw. 2-unit motor-generator sets, two 50 kw. generators, two 50 kw. generator sets, one 1600-1200 hp. motor and switchboard apparatus. All this equipment is being built and is to be installed by the General Electric Company.

The Crane Company has moved its general offices to 836 South Michigan avenue, Chicago, Ill.

Cold Metal Saws of New Design

Cold metal saws of new design have been brought out by the Lea-Courtenay Company, Inc., 90 West street, New York. Much stress is laid on the effective cutting range which the machines possess. In fact the claim is made that the saw has no non-effective cutting range because



Motor Driven Lea-Courtenay Saw with Blade at Top of Arc

every inch of the blade which extends above the table can be used for sawing and the operation can be performed on either side of the table with equal facility. The arc through which the center of the saw moves is always below the level of the liquid in the lubricating tank to guard against leakage, and the two sections are bolted together and dowel pins are inserted to secure rigidity and correct alignment. The top of the table has three T slots—the outside ones for holding swivel V blocks and the middle one for holding work of irregular shape. The top of the table also has two rows of holes for inserting pins to be used as the work stops.

Partly for convenience in manufacturing but principally to secure perfect castings, the frame is made in two pieces. The top part is joined to the base at a point slightly above the level of the liquid in the lubricating tank to guard against leakage, and the two sections are bolted together and dowel pins are inserted to secure rigidity and correct alignment. The top of the table has three T slots—the outside ones for holding swivel V blocks and the middle one for holding work of irregular shape. The top of the table also has two rows of holes for inserting pins to be used as the work stops.

Throughout the machine the greatest care has been exercised to select the proper type of bearing. The sprocket shaft runs in bronze bearings. Some bearings are babbitted, others are of reamed cast iron. Five bearings which are in such positions that a careless operator might neglect them are oilless bearings requiring no attention. The thrust on the worm which drives the feed mechanism is taken on a ball bearing; and the vertical shaft which carries the end of the arm when the blade is cutting also runs in a ball bearing.

The swing arm turns on heavy trunnions. One is mounted on the center of the frame and the other is supported on the outside by an outboard bearing over a heavy pedestal. Both are fitted with heavy tubes which take the weight of the swing arm and entirely prevent it from resting on the drive shaft. The trunnion next to the frame is fitted with an oilless bearing, for the reason that this is a bearing which an operator is likely to neglect. The saw is fed into the work by a heavy quadrant working against a large worm on a vertical shaft. The power is transmitted from the main drive shaft to the sprocket shaft by heavy gears. The spur gears are of cast steel and the two bevel gears are planed from tool steel. There is one shaft in the swing arm which is vertical and this runs in an oilless bearing.

On all of the machines of this new line the gear box

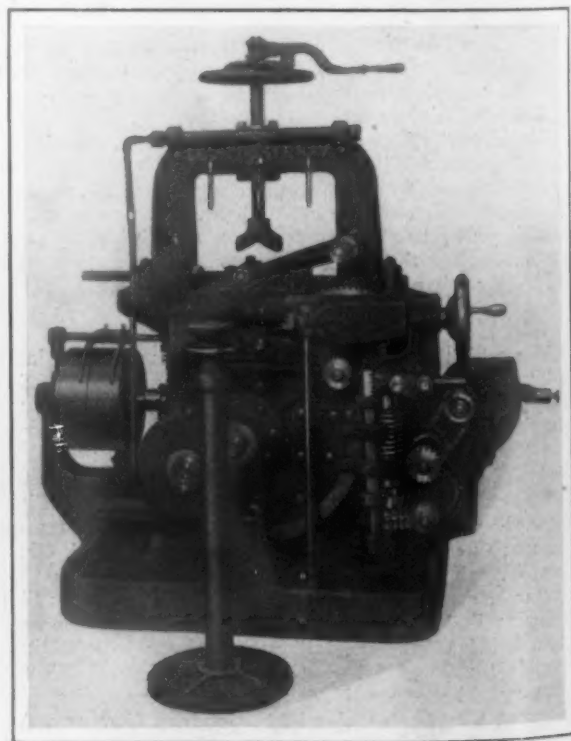
containing the feed mechanism is carefully designed and constructed. On what is known as the No. 21 machine it is possible to get any one of ten different rates of feed almost instantly by moving a small swing arm. The feed box is driven by a roller chain taking its power from the main drive shaft which runs through the swing arm. At the point where the power is transmitted to the box is a slip gear driven between two fiber washers under a heavy spring tension which will readily slip in case the blade is not sharp enough or in case it should become so jammed that it could not relieve itself.

The new saw has an improved sprocket drive, the sprocket being of Krupp chrome nickel steel engaging radial slots in the blade close to the periphery of the latter so that the saw is pulled through the work without backlash. Steel guides on either side of the saw just outside the sprocket serve to eliminate side thrust. The sprocket is case hardened and fastened to the spindle by a taper nose and key.

The machines are supplied with a balanced vane pump capable of delivering a large supply of oil through several flexible tube nozzles at the right point on the blade. In cutting bar stock it is seldom necessary to use more than two of the nozzles, but in cutting structural shapes on the larger machines it is advisable to use all nozzles at once.

For clamping the work, in addition to the handwheel on top of the screw there is a cast steel lever with a lug fitted in the spokes of the clamp wheel so that it is not necessary to hunt for a wrench or a bar in tightening up the work. The lower end of the clamp screw is case-hardened and fits into the upper V block which is a heavy steel casting with two grooves, one of 90 deg. and one of 120 deg. The latter is used in holding very small stock. Swivel V blocks are a part of the regular equipment. They can be placed in one position with the taper edges together to cut round bars or angles; or the square edges can be placed together to hold structural shapes or square bars. They can be clamped to the table at any angle so that angle cuts can be rapidly made without stopping to adjust each and every piece. On the left side of the clamp arch there is a work stop held in position with lock nuts which can be arranged to take the entire side strain of the work. All machines are fitted with a gauge to cut stock to any length desired.

A handwheel placed in a vertical position and connected to the vertical shaft by plain steel bevel gears is provided for raising and lowering the blade by hand. Should the saw blade become jammed in the cut as the result of im-



Belt Driven Lea-Courtenay Saw with Blade Near Lowest Point

proper feeding, it is possible to relieve the feed instantly and move the blade backward either by hand or by power. When the saw blade has reached its predetermined point the feed is stopped by an automatic trip and the blade is brought back to the starting point by power at a rapid rate. The operator, without moving his position, can start, stop and reverse the feed mechanism or can change the rate of feed at will.

The belt-driven Lea-Courtenay saws have tight and loose pulleys which can be manipulated by the operator without leaving his working position. Where there is motor drive a large sprocket wheel for the motor chain is entirely inside the frame and the sprocket is mounted directly on the main drive shaft. The motor is supported on a bed plate bolted to the frame of the saw, using the same bolt holes that are used for belt drive. For motor-driven machines a motor is recommended with a speed variation of about 33 per cent. obtained by field control, as it is possible by this means to get a variation of the cutting speed from that necessary to cut tool steel to that needed for the softest structural material, by moving a handle on the rheostat.

Razing a Bridge with the Oxy-Acetylene Torch

Among the recent applications of the oxy-acetylene process in contracting work was the dismantling of the old Gay street bridge, spanning Jones' Falls, Baltimore, Md. This stream, which runs through the heart of the city, has been more or less of an eye-sore for some time past, and it was finally decided to build a concrete structure over the water, thus not only abating the nuisance, but also giving a broad street. The apparatus used on this bridge was furnished by the Alexander Milburn Company, 1420 West Baltimore street, Baltimore, Md. The saving effected in this work was not only in actual money but also in the time required and the amount of hand labor which was possible to dispense with.

Accumulations of rust which had increased the thickness of some of the I beams from $\frac{3}{4}$ to 3 or 4 in., and the thickness of built-up sections retarded the cutting to some extent, but the 20-in. I beams were cut in about 6 min., average time. The eye-bars used in spans had an approximate cross section of 7 x $1\frac{1}{2}$ in. and these were severed at the rate of 40 in 2 hr. An individual bar was cut in less than 2 min. The entire bridge, which was 80 ft. long, and carried two trolley tracks in addition to roadways for vehicles and walks for foot passengers, was cut in an amount of time equivalent to that of one operator working continuously for 30 hr.

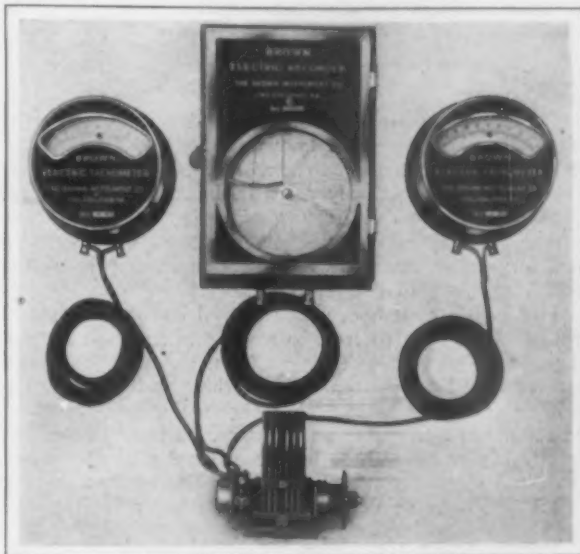
In addition to the dismantling of the bridge, the cutting torch was also used for piercing and cutting off sheet piling and other work involved in the contract for the whole improvement project which was awarded to the Elkins-Tuft Construction Company, New York City.



View of a Portion of a Bridge Which Was Dismantled with Oxy-Acetylene Apparatus Supplied by the Alexander Milburn Company, Baltimore, Md.

Indicating or Recording Electric Tachometer

For indicating accurately or recording on a chart the number of revolutions made per minute by a rotating shaft or wheel, the Brown Instrument Company, Philadelphia, Pa., has brought out a new electric tachometer



A Group of Indicating and Recording Electric Tachometers, Made by the Brown Instrument Company, Philadelphia, Pa.

or speed indicator. Among the uses for which the instrument is adapted are to give the speed of engines, to indicate the cutting speed of large machine tools, in connection with blowing engines at blast furnaces and for indicating the speed of locomotives being tested.

The instrument consists of a small magneto or generator, especially designed for use with the tachometer and generating 24 volts at 1000 r.p.m. By reason of the voltage generated it is pointed out that an instrument which is absolutely dead beat in operation can be supplied. On account of the high resistance, over 3000 ohms, the length of the leads connecting the generator and the indicating instrument does not affect the readings, and it is possible to connect one, two or three instruments to the same generator, as shown in the accompanying engraving, without disturbing the indications. One of the particular advantages claimed for the ability to use instruments in multiple is that after an indicating instrument has been installed in connection with the generator it is sometimes found desirable to place a recording instrument in the office or at some other convenient point, and this can be done without it being necessary for the instrument to be recalibrated.

Either recording or indicating instruments can be used, and in the accompanying engraving two indicating and one recording instrument are shown connected to the common generator, which is driven by a chain and sprocket. One of the places where a combination of this character is used is in a blast furnace plant where gas or steam blowing engines are employed. It is, of course, necessary to run these engines at a constant speed so that a certain number of cubic feet of air per minute can be blown into the furnace. The number of revolutions per minute in this case is indicated at the engine or switchboard, and by placing a recording instrument in the office it is possible to secure a record of the variations in the speed and regulate them. Multiple instruments are also used on shipboard to indicate the speed of the propeller shaft in the engineroom, and also in the chartroom and on the bridge. In such a case the small generator is driven by gears directly from the main propeller shaft and three indicating instruments are connected to the one generator, so that indications of the speed can be secured at various points about the ship.

The Jeffersonville, Ind., plant of the American Car & Foundry Company has a contract for 40 coaches for the International Railway of Mexico. They will be of wood, the climate of Mexico being too hot for steel cars.

Determination of Oxygen in Iron and Steel

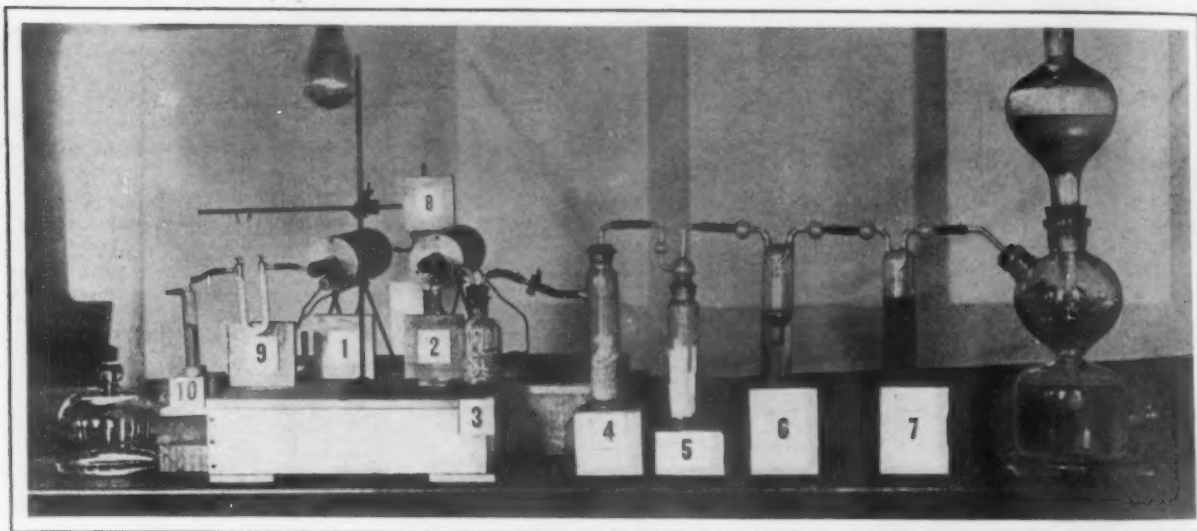
The Application of the Electric Resistance Furnace to a Modification of the Ledebur Method

BY R. H. MCMILLEN*

The fact that iron and steel always contain more or less oxygen has long been known, and about 30 years ago Ledebur¹ called attention to it and gave a method for its determination. It is only recently, however, that the requirements in the manufacture of high-grade steels have become so exacting that the determination of oxygen in steel and other materials has come to be a part of the routine required of a steel laboratory.

The Ledebur method, which is well known, consists in heating the sample of iron or steel in nitrogen to remove all moisture without oxidizing it, then reducing the oxides at a red heat by hydrogen and absorbing and weighing the resultant water. Cushman² has shown that the drying of the sample in nitrogen is unnecessary, his results being but slightly higher than those by the original method. When used with electric resistance furnaces this method is very satisfactory for the determination of oxygen in iron and

tubes are connected in the rear by a U tube (not shown) having close fitting glass stop-cocks. This U tube is filled with phosphorus pentoxides opened by small glass beads. The phosphorus pentoxide absorbs any water which may be formed in the tube of furnace No. 2, and insures absolutely dry hydrogen to pass over the sample in furnace No. 1. The front end of the quartz tube in No. 2 furnace is connected to the drying and purifying train leading from a hydrogen generator. No. 3 contains small pieces of pumice stone saturated with concentrated sulphuric acid; No. 4, soda lime; No. 5, stick potassium hydrate; No. 6, 50 per cent. solution potassium hydrate; No. 7, 25 per cent. solution of pyrogallol made alkaline with potassium hydrate. Hydrogen is generated in a 64-ounce Kipp apparatus by the action of chemically pure hydrochloric acid on pure mossy zinc. The water formed by reduction of oxides in the sample is absorbed in U tube No. 9 of same



Apparatus for the Determination of Oxygen in Iron and Steel by a Modification of the Ledebur Method

steel, tungsten³ and other non-volatile metals. Even this method, however, will fail to show all the oxygen in metals containing oxides of silicon, vanadium, titanium and other elements whose oxides are not reduced below 950 deg. C.⁴

The following modification of the Ledebur method has been found to give most satisfactory results:

Apparatus

The apparatus consists of two electric resistance furnaces, such as are employed in many steel laboratories for combustion carbon determinations and capable of maintaining a temperature of 950 deg. C. They are designated as No. 1 and No. 2 in the accompanying illustration. Both furnaces are equipped with heavy walled, fused quartz tubes $\frac{7}{8}$ in. inside diameter by 24 in. long. The function of furnace No. 1 is to heat the sample under investigation, while that of No. 2 is to heat the hydrogen so that it may combine with any oxygen that may be carried over from the hydrogen generator. Several spirals of platinum gauze are placed in the quartz tube of this furnace. The quartz

construction as No. 8, and also filled with phosphorus pentoxide opened with small glass beads. A guard tube, No. 10, is attached to No. 9 and contains concentrated sulphuric acid. A small wash bottle of Drexel form is used for this purpose. Porcelain boats of sufficient size to hold at least 25 grams of the sample are employed.

Sample and Procedure

Great care must be taken in preparing the samples so that they be free from rust or foreign oxides. In the case of iron or steel samples both the fine and coarse drillings are rejected, only those between 20 and 30 mesh being used. These are dried for at least one hour over concentrated sulphuric acid before using. Samples of tungsten powders are dried to a constant weight in the drying oven at a temperature of 105 deg. C.

Twenty-five grams of the prepared drillings are weighed into the dried porcelain boat and placed in the tube of furnace No. 1. Connection is made to the weighed U tube, No. 9, through which, just previous to drying for 15 minutes and to weighing, hydrogen has been passed for 10 minutes. Guard tube No. 10 is connected. Hydrogen is allowed to pass through the whole apparatus at a rapid rate for 15 minutes. For the first run it is advisable to allow the hydrogen to sweep through the whole apparatus for 30 minutes to insure complete expulsion of oxygen from the train and tubes. The train and quartz tube of furnace No. 2 can be kept constantly filled with hydrogen by closing the cocks of the U tubes No. 8 whenever the flow of hydrogen is interrupted.

*Crescent Laboratory, Crucible Steel Company of America, Pittsburgh, Pa.

¹Sauerstoffbestimmung im Schmiedbaren Eisen. Stahl und Eisen, vol. 2, page 193.

²The Determination of Oxygen in Iron and Steel. Journal of Industrial and Engineering Chemistry, vol. 3, page 372.

³Tungsten powder often contains a rather larger percentage of oxides. Some commercial samples investigated by the writer recently have shown an oxygen content corresponding to 12 per cent. WO_3 . It is probable, however, that the whole of the oxygen is not combined with the tungsten.

⁴See "Determination of Oxygen in Iron and Steel by Reduction in an Electric Vacuum Furnace," by W. H. Walker and W. A. Patrick, Journal of Industrial and Engineering Chemistry, vol. IV, page 799.

The electric current is turned on and continued for one hour after the maximum temperature has been reached. During this time the flow of hydrogen is cut down to about 70 bubbles per minute, this rate being maintained until U tube No. 9 is removed. At the end of the hour the current is turned off and furnaces allowed to cool, accelerating the cooling with a blast of compressed air. When the quartz tubes in the furnaces show no visible redness, cocks of U tube No. 9 are closed and a pinch cock is inserted over the rubber tube connecting U tube No. 9 to the quartz tube of furnace. In this manner oxygen is kept from the heated tube, thereby avoiding danger of explosion. Then U tube No. 9 is disconnected and carefully wiped with soft dry cloth, dessicated over concentrated sulphuric acid for 15 minutes and finally quickly weighed. Weight of water, after deducting blank, multiplied by 0.8888 divided by 25, equals oxygen.

A blank should be run frequently, adhering to all details as to time of heating furnaces, dessicating U tubes, etc. Usually the blank found varies between 0.0015 and 0.0025 gram.

For samples of tungsten powder the same procedure is carried out except that a smaller sample is taken, varying from one to ten grams, according to amount of oxygen present.

The following table gives results on several samples in duplicate by the above described procedure:

No.	C.	Mn.	S.	P.	Si.	O.	Duplicate, O.
1 Crucible steel	1.15	.31	.018	.011	.22	.039	.037
2 Crucible steel	1.17	.31	.015	.010	.22	.035	.035
3 Crucible steel	1.14	.33	.016	.009	.21	.044	.045
4 Basic open hearth steel..	.07	.06	.019	.008	.08	.113	.115
5 Basic open hearth steel..	.08	.22	.016	.008	.01	.079	.072
6 Swedish wrought iron...	.06	.17	.019	.012	.02	.345	.353
7 Domestic wrought iron...	.69	trace	.009	.007	.06	.069	.076
8 Domestic wrought iron...	.73	trace	.009	.007	.06	.090	.089
9 Acid open hearth steel...	.36	.69	.040	.046	.03	.043	.042
10 Bessemer steel .....	.46	.72	.041	.095	.09	.058	.060
11 Tungsten powder.....						2.57	2.57
12 Tungsten powder.....						1.37	1.34
13 Tungsten powder.....						.55	.56
14 Tungsten powder.....						1.02	1.05

*This sample fractured badly in rolling.

Numbers 1, 2 and 3 were three ingots made under as nearly the same conditions as possible. It is not intended that the above table should be typical as to the oxygen content that exists in the different classes of steel. In many samples of crucible steel, it is much lower than those cited.

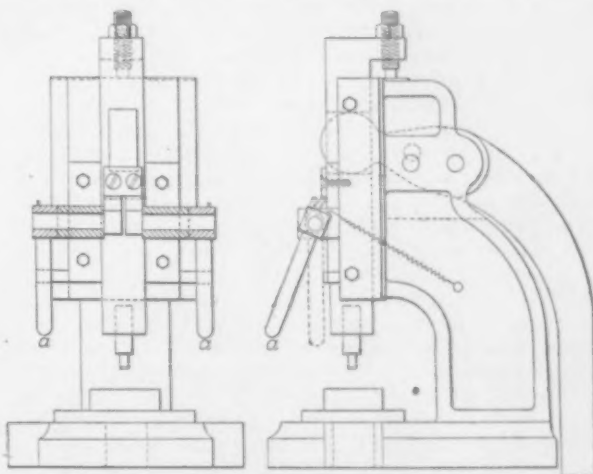
Replacing an Engine Through the Power House Roof

A novel method of removing an engine from a power house and replacing it with a larger one was recently resorted to by the Browning Engineering Company, Cleveland, Ohio. Instead of tearing out the side of the building and taking the engine out on rollers, a hole of the required size was made in the roof and the engine was lifted out by one of the company's 50-ton cranes which happened to be available at the time. The operation of

handling the engine bed plate and flywheel, weighing about 10 tons, is shown in the accompanying illustration. The boom of the crane is 60 ft. long. Only a minute and a half elapsed from the time that the bed plate was hooked on the crane until it was deposited on the ground outside. The bed plate and flywheel of the new engine, which were lowered through the roof, weighed about 20 tons. In addition to handling engines the crane was used to handle through the roof the material used in building new foundations for the larger engine.

A New Safety Device for Foot Presses

The necessity for the operator to use both hands to release the slide before it can come down is the special feature characterizing the safety device for foot presses



The New Safety Device for Presses Operated by a Foot Treadle Developed by the La Salle Machine & Tool Company, La Salle, Ill.

which has recently been brought out by the La Salle Machine & Tool Company, La Salle, Ill. In this way it is emphasized that it is impossible for the operator to receive injury by getting his hand or finger under the slide. The two small hand levers work entirely independently of each other and the slide is not released until both are pulled simultaneously, this arrangement making it necessary for the operator to use both hands. These levers are made of drop forgings which fit through a casting bolted to the head of the press and there is also a small piece of machinery steel screwed on the slide under which the safety catches lodge until they are released by the hand levers.

A photograph has been received from the Montgomery-Lucas Company, 305 East Pike street, Seattle, Wash., giving an illustration of samples of remarkable cutting done with a new oxyacetylene torch brought out by that company. It is stated that with this torch not more than 25 lb. of oxygen pressure is needed in cutting metal 1 in. thick; not more than 55 lb. in cutting 6 in.; not more than 80 lb. in cutting 10 in., and not more than 125 lb. in cutting 15 in. Those who are familiar with oxyacetylene cutting can make their own comparisons with the work said to be done by this torch.

The sale of the property of the Allis-Chalmers Company, including the plants at Milwaukee, Chicago and Scranton, is scheduled for February 27 by order of the court. This follows the announcement of foreclosure proceedings instituted by the bondholders, which foreclosure sale was authorized by court decree December 4.

The Epping-Carpenter Company, manufacturer of pumping machinery, has opened a district sales office at 131 State street, Boston, Mass., in charge of James J. Hart, formerly with the International Steam Pump Company and the Warren Steam Pump Company.



How a Power House Engine Was Removed and Replaced

The Purchasing Agent and Publicity

Two Neglected Factors in Price Stabilization—Some Suggestions from Arthur J. Eddy's "New Competition"

BY JOHN C. JAY, JR.*

Modern competition seeks to regulate the controllable variable. The unfair method, the unjust discrimination fall without the modern business view. Railroad rebates are no longer merely illegal, they are regarded as immoral. Conversely, improper commissions and bribes to employees are no longer merely immoral, they are considered unbusinesslike. The salesman whose chief ability lies in getting business by improper methods has short shrift in the modern corporation.

In the long run, stability in prices confers marked benefit on any industry, and to accomplish this stability has been the dream of many. The gentleman's agreement, the social lunch "to talk things over," the combination in restraint of trade, the illegal association, in fact all the various devices to accomplish this maintenance of price stability, however iniquitous they may have been considered from the standpoint of public policy, have all had back of them the sound axiom that all waste is economic loss. There is nothing but economic loss in the condition of cut-throat competition that permits the Chicago merchant to sell in New York the same article that the New York merchant sells in Chicago. The wastefulness of such a condition has long since been recognized in our financial system, and the very payments in the above transaction would not be by means of return shipments of money, but by an adjustment of credits.

Importance of Publicity

The greatest single factor in the stabilization of prices is publicity. In the retail business this principle is now firmly established. We no longer bargain or dicker over the price of any article we commonly purchase. Prices are fixed and are openly stated. The secret price mark is an anachronism and only antagonizes. The modern store labels every article plainly, so that he who runs may read; customer, competitor, newspaper reporter and general public alike are free to know what each and every article in that store sells for, because the price marked thereon in plain figures cries aloud to the world that that honest merchant sells that particular article to all at the same price. The average man wishes to live and let live; he wishes to pay a fair price and a living wage, but he does not want to be discriminated against. What he wants is the knowledge that the price asked is fair, and that his neighbor cannot buy for less.

Mr. Eddy's Associations

To apply successfully this fundamental modern idea to the marketing of the cruder wholesale products, and especially to the steel industry, has been the particular work of Arthur J. Eddy, who is today counsel for the Steel Casting Association, the newer Manganese Steel Casting Association, and the Bridge Builders' Society, all successful going associations, observing in all respects the law in regard to restraint of trade. These associations have as their fundamental starting point, publicity—the free exchange of prices and information. Any one having legitimate interest is welcome at the meetings, there are no secret agreements, no understandings to raise prices, nothing but the one common obligation to quote prices publicly, to mark the goods, to play fair with competitor and customer alike. Mr. Eddy in his written articles has called it the "new competition," and no better name could be given. Before this new competition, that bane of all business, the dishonest buyer, loses his terror. No longer can he browbeat the seller with the story of how a competitor has underbid him, and that he had better revise his price. Before the modern competition the untruthful buyer stands branded for what he is, for each

competitor knows the price every other one has quoted, and while each competitor is at perfect liberty to change his price, none is clubbed into it by false statements or fear of what his neighbor may have done.

All of these devices, however, steps forward though they are, touch but one side of the stabilization of industry and prices. They are selfish merely, for they are designed as protective measures. Recognition of the necessity for organization in any industry is attested by the multitude of such organizations in existence. Many of them are technical merely, yet they accomplish for all what each by himself would be helpless to attempt. They foster, raise and develop by the proper discussion of common problems and the standardization and improvement of product. They systematize, they stabilize. The American Iron and Steel Institute is a case in point in the steel industry. Touching it and overlapping are such organizations as the great engineering societies, the societies for testing materials, the railway associations, the traffic associations, etc.

The Purchasing Agent a Factor Apart

Into these schemes for the steadying and stabilizing of all of these great allied industries the purchasing agent does not fit. As a matter of fact, he plays practically no part in the movement of development; he is seldom taken into account in any comprehensive plans involving the growth of the business or industry. Such influence as he has is, as a matter of fact, one of disintegration. This is so of necessity, for the purchasing agent, a recent development in corporate organization, is peculiarly alone, peculiarly aloof. His value to his employer appears to him, and most frequently to his employer also, to lie in his ability to buy cheaper than the purchasing agent of a rival company. For his information he must depend largely upon the bids he receives or the salesmen he interviews. His duty appears to be to get the advantage, to push the shrewd bargain, to shade prices a little closer than his neighbor can do. Of that neighbor, of the army of those neighbors, and of their methods, he knows little. His contracts with them are few; seldom can he compare notes, nor would he probably, for he is hired to buy cheaper than the other man can. Publicity for him appears fatal; it would spoil his trade.

It was not many years ago that every shop had its foreman who kept his methods to himself, lest some one take his job. Today that type has nearly disappeared before modern practice. Publicity has made improved methods and progress practicable, and the entire industry has benefited.

The attempts to stabilize prices have in nearly all cases neglected to take the purchaser into account. There has been more or less united action, oftentimes merely protective, against the buyer. There has been little recognition of the fact that in the modern purchasing agents of numberless corporations there are opportunities for contacts with numberless industries. In these very purchasing agents lie possibilities of price stabilization that could not help but be beneficial in the long run to not one group alone, but to many groups. The purchasing agent of any one large corporation has intimate contacts with almost every big industry. Individually his ability is only destructive; collectively there lies in these purchasing agents possibilities of the greatest constructive value. An association of purchasing agents, properly organized along big constructive lines, with high ideals and standards, has in it latent power for untold good.

Why Purchasing Agents Should Organize

A salesman selling a standard article once told the writer that he had sold that same article in one day to the purchasing agents of three great railroads, and at

*General manager of sales, Pennsylvania Steel Company, Philadelphia.

a different price to each. The writer knows of one large railroad system, having two purchasing agents, which buy the same article, a mechanical specialty, for two prices. What chance have the purchasing agents of any industry to show their influence toward price stability, when such collusion is found in one corporation? How can such things be? They exist merely because purchasing agents have no common meeting ground, no contacts with each other, no publicity. The very salesman who boasted of selling his commodity at three different prices was guilty of an economic misdemeanor. The railroads are great public utilities. It is to the advantage of all that they be efficiently and economically managed. As they touch intimately every single industry in a most vital point, their ability to prosper and give adequate service is of interest to all. It is essential that they be competently administered. They should pay fair prices for their equipment and maintenance, yet every industry should co-operate in their problems. The remedy for all such abuses is cooperation—cooperation by publicity. Organization to secure such proper publicity and cooperation is necessary, and this implies an association of purchasing agents. No honest manufacturer has anything to fear from such an association of purchasing agents, properly organized, with proper purposes, and with its full publicity and exchange of price information and shop talk. It would aid in the free and speedy operation of the law of supply and demand; it would check and control speculative buying and the aggression of the middleman; it would be a formidable weapon against every form of secret dishonesty, for membership in such an association could be made to mean character. It would raise the tone and morals of every industry that felt its contact.

The honest manufacturer welcomes intelligent open buying. The long-established policy of publicity in Governmental work has hurt no one, the manufacturer least of all. No advocacy is here made of the application to private corporations of the red tape and safeguards necessary in Governmental work. The point at issue is that we have traditionally become wedded to the secret price, and are ridiculously afraid that our competitor will learn our prices. The absurdity of this lies in the fact that any proper selling organization prides itself on its ability to find out what its competitors are quoting and furnishing. This very ability leads often to abuses, which it is to the interest of the industry to correct. Rather than to fear such an association of purchasing agents, if organized on proper lines, we should recognize that it would create higher standards, that it would strengthen, conserve and stabilize.

Heavy Hardware Jobbers Elect Officers

The Heavy Hardware Jobbers' National Association, an organization comprising about 35 wholesalers of heavy hardware in the Central West, held its annual convention in Chicago January 23 and 24, and elected the following officers for the ensuing year: President, W. H. Grant, Bonniwell-Calvin Iron Company, Kansas City, Mo.; first vice-president, W. J. Dean, Nichols, Dean & Gregg, St. Paul, Minn.; second vice-president, R. R. Englehart, Sieg Iron Company, Davenport, Iowa; third vice-president, Hayden Robinson, E. D. Kimball & Co., Chicago; secretary, Roy S. Tuttle, 108 South La Salle street, Chicago.

Such subjects as credits, collections, salesmanship and other topics bearing upon the relations of hardware jobbers and their customers were discussed informally at the convention sessions. There was no set programme. A banquet took place Thursday evening, January 23, at the La Salle Hotel.

The Lipsitz Company, Chelsea, Mass., has placed a contract with the Browning Engineering Company, Cleveland, Ohio, for a 15-ton locomotive crane equipped with a magnet, and expects to have the machine in use early in February. With the additional land purchased a few months ago for extending its yard the company will have one of the largest and best equipped yards in New England for handling scrap of all grades. It will make a specialty of handling heavy material, such as boilers and massive machinery.

American Steel and Heavy Hardware Jobbers

Officers of the American Iron, Steel and Heavy Hardware Association met in Buffalo, N. Y., January 25, with the members of the local committee on arrangements to prepare a programme for the entertainment of the membership of the association at the fourth annual convention, to be held in that city June 10, 11 and 12, and to perfect the organization of the various sub-committees. The details were discussed at a dinner held at the Buffalo Club, at which were present the president of the association, Charles E. Faeth, Faeth Iron Store, Kansas City; the vice-president and chairman of the executive committee, Charles M. Roehm, Roehm & Davison, Detroit; the secretary and treasurer, E. R. Yarnelle, whose headquarters are at 47 West Thirty-fourth street, New York City; the members of the Buffalo general committee, the chairmen of the sub-committees and others.

Among the features of the entertainment which were practically decided upon were a visit to the plant of the Lackawanna Steel Company; a trip by trolley to the Buffalo Bolt Company's works at Tonawanda (midway between Buffalo and Niagara Falls), where a luncheon will be served after inspection of the plant; the party then to continue by trolley to Niagara Falls, where the afternoon will be spent viewing points of interest, the electric power plants, etc.; for another day a trip is planned to the Automobile Club's country club house, with refection, music and dancing in the evening; also contemplated is a boat trip on the lake and river. Following are the officers of local committees: Chairman of the general committee, George E. Enos, Enos & Sanderson Company; vice-chairman, Eugene J. McCarthy, Beals & Co.; secretary, Henry B. Saunders, head of the publicity bureau of the Chamber of Commerce. Chairmen of the sub-committees: Advisory, L. Van Ostrand, Buffalo Bolt Company; reception, H. W. Wendt, Buffalo Forge Company; entertainment, Fred C. Deming, Carnegie Steel Company; finance, Burton S. Fletcher, United States Horse Shoe Company, Erie, Pa.; ladies' reception, Mrs. Burton S. Fletcher; information, Charles P. Rogers, Beals & Co.; transportation, George W. Smith, Lackawanna Steel Company; reservations and hotels, Arthur L. Manley, Firestone Tire & Rubber Company; banquet, Allan Fraser, American Steel & Wire Company; speakers, George C. Finley, Beals & Co.; press and publicity, James A. Pierce, Buffalo Morning Express.

A Profit-Sharing Plan with Piece Work

Grand Rapids, Mich., newspapers recently referred at length to the announcement of a profit-sharing plan made at the beginning of the year by President Charles P. Foote of the Clipper Belt Lacer Company. It is proposed that employees who at the end of 1913 have been with the company one year or less will receive in cash 5 per cent. of the amount they were paid in wages in the year; employees of two years' standing, 6 per cent.; of three years, 7 per cent., and so on, 1 per cent. being added each year until 10 per cent. is reached. A proviso is made that the profits for each year shall warrant such an outlay. The work day has been 10 hours heretofore, but a nine-hour day has now been established, with a Saturday half holiday. Up to January 1 the basis for paying machinists was 27½ cents an hour. This year payment will be by the piece and the management announces that it will not lower piece prices, once established. For some time piece work has been in effect in the department in which women are employed. At the outset these operators of carding machines were paid \$1.25 a day, or \$7.50 a week. Under the piece price system few of the women now earn less than \$14 a week. The publication of these details of operations at the Clipper Belt Lacer Company shop was apparently prompted by a recent discussion among Grand Rapids manufacturers and in local newspapers, of the delinquency of female shop employees. The newspapers and some of the contributors to their columns attributed much of this to the low wages paid girls and women employed in local industries.

The Carbon Steel Company will move its New York offices January 31 to the sixteenth floor of the Cameron Building, Thirty-fourth street and Madison avenue.

The Government's Star Witness

W. E. Corey, Former President of the Steel Corporation, Pleases the Prosecution More Than Others Thus Far Called

Beyond question, the star witness for the Government thus far in the suit now being prosecuted for the dissolution of the United States Steel Corporation is W. E. Corey, its former president and still a director. He was placed on the stand in New York City on Wednesday, January 22, and his testimony was so much more directly in line with what the Government seeks to prove than that of previous witnesses that he was kept before the examiner four days.

Object of Pig Iron Purchases

When Mr. Corey's examination began he was questioned about purchases of pig iron made by the Carnegie Steel Company, with a view to keeping up prices. Mr. Dickinson, for the Government, based these questions on extracts he read from the minutes of the executive committee of the company, detailing arguments between Mr. Corey, Judge Gary and James Gayley as to just how high pig iron should be kept. He read from these minutes a statement which showed the purchase of 65,000 tons that "should not be put on the market, and would add stability to the prices of iron and steel."

"Was the object of the purchase to maintain the price?" asked the attorney.

"That was the object," said Mr. Corey.

"Was it the policy of the Carnegie Company to buy iron for the purpose of maintaining the price of finished products?"

"At various times the company did buy iron for that purpose."

Mr. Corey denied that purchasing of pig iron for this purpose was a consistent policy of the Steel Corporation, but conceded that this was the object, "at certain times."

Mr. Dickinson asked what effect these purchases had on sliding scale contracts, contracts with the corporation where the prices depended upon the price of pig iron. Mr. Corey answered that so far as the corporation was concerned, the difference was "immaterial."

"How about the purchaser?" asked the counsel.

"There might be a difference, but I do not think it amounted to much," was the reply.

Mr. Corey did not know anything about the formation of the Steel Corporation because he was in Pittsburgh running the Carnegie Steel Company's Homestead works when it occurred. He said that after he came to New York in 1903 as an officer of the parent company he did acquire some knowledge of such things as prices and understandings.

The Rail Combination

Questioned about a steel rail pool, he denied knowledge of an alleged pool formed by subsidiaries of the Steel Corporation in 1898, three years before the formation of the corporation. He admitted, however, that from 1901 to 1904 a pooling arrangement existed among certain rail manufacturers in which the Carnegie Steel Company and the Illinois Steel Company, both subsidiaries of the Steel Corporation, participated. "During that period," he said, "friendly relations existed among different manufacturers of steel rails whereby each company manufactured a certain amount, and generally their price was the same. These companies included the Lackawanna, Cambria, Pennsylvania, Illinois and Carnegie." The Colorado Fuel & Iron Company was sometimes in and sometimes out of the combination, but he did not remember that the Tennessee Coal, Iron & Railroad Company was ever in it. It was always a competitor. He said that Judge Gary and Charles M. Schwab sometimes represented the Steel Corporation at conferences of the pool and that he himself represented the Carnegie Steel Company.

Mr. Corey was sure there never was an agreement, only an understanding, and it seemed as if it began about 1901. Mr. Dickinson wanted to know if just before they had come together the price of rails had not dropped from \$35 a ton to \$26 a ton. Mr. Corey could not remember. He only remembered that the price had gone up to \$28 a ton later because it has been at that figure so

long that he could not say when it was at a different figure.

"Was this rail pool conducted like the plate and structural pools?" asked Mr. Dickinson.

"I understood that it was conducted much better," said Mr. Corey. Earlier evidence had shown that most of the old pools went to pieces as soon as one of the participants saw a chance to make a good sale below the agreed price.

The International Rail Trade

Mr. Dickinson turned to a Government exhibit and read the reported minutes of a meeting of the executive committee of the Steel Corporation in 1904. There was mention of the fact that a proposition to invade the foreign markets had been left to Mr. Corey and Judge Gary, chairman of the board, to decide, with power. Mr. Dickinson wanted to know about that, what came out of it.

Mr. Corey said that as far as the details were concerned they must be gleaned from James A. Farrell, now president of the corporation, but speaking broadly, he could say that sometime afterward an understanding was reached between the iron producing countries of the world which provided that no iron producing country should invade the other iron producing country.

"What was the understanding?" asked Mr. Dickinson.

"It related to the business in the neutral countries," was the answer. Mr. Corey explained that a neutral country meant one that did not manufacture iron.

"What does that mean, that the manufacturers of the world apportioned countries to countries?" asked Mr. Dickinson.

"Oh, no," was the reply. Then Mr. Corey explained that the United States, England, France, Germany and Belgium got together and agreed that one should not try to sell in the other's country, and further that the business in the neutral countries should be at a price understood and with the tonnage determined. Each country then sold a certain amount each year in a neutral country at a price fixed.

"In this international steel rail pool," said Mr. Corey, "there participated the United States Steel Corporation, the Lackawanna and the Pennsylvania steel companies in this country and manufacturers in England, France, Germany, Austria and Belgium." He said that conferences with European manufacturers were held abroad, the Steel Corporation being represented by Mr. Farrell.

"I am of the opinion," said Mr. Corey, "that the working arrangement helped to considerably increase the foreign business of the Steel Corporation."

Mr. Corey then said that the British colonies were not neutral ground because of a preferential tariff in them, and it was understood later that the countries were Italy, Portugal, Greece, the near East, the far East, Africa, South America, Central America and Mexico. How the allotments were made was not explained. He said the arrangement was in force in 1910, the year he resigned from the presidency, and attorneys for the Government say that the agreement is still operative. The Government contention is further that a clearing house was established in London, in which each country received its proportionate share at the uniform price.

Long Contracts with Large Consumers

Mr. Dickinson then took up domestic business and read a minute from a meeting in which it was stated that the company's "back-log" business took in about all the big

consumers of steel plates in the country except possibly the American Car & Foundry Company. The corporation had tied many other companies, like the American Can, Pressed Steel Car, Oliver and others, with long-term contracts. It later developed that the American Car & Foundry Company had a contract to take only 5000 tons a month.

A question to Mr. Corey brought out the answer that backing business meant something solid and substantial, like 15,000 or 20,000 tons a month; something to keep the mills going, the fires burning, no matter what happened. It was stated in a minute that if they were to insist upon a still greater part of the plate business some of the independent companies might start car companies of their own and thus split up the business; they therefore allowed car companies to buy of the outsiders like the Jones & Laughlin and Lackawanna steel companies.

Not Always in Accord with Judge Gary

At his examination on the following day, January 23, persistent questioning deduced from Mr. Corey admissions that he was not always in accord with Judge Gary as to the policy of the Steel Corporation. It was brought out that he wanted to fight the Union and Sharon companies, in which Mr. Frick was a large stockholder, instead of placating or buying them out. He was flatly opposed to the understandings and agreements that came out of the Gary dinners. He fought the Hill ore leases on the ground that the terms were bad and the price demanded twice too high. He was in favor of an open or competitive market and the survival of the fittest. The minutes showed, however, that Mr. Corey usually failed to win at the meetings of the finance committee, the board of directors and the Carnegie board of managers.

Mr. Dickinson first took up the international steel rail agreement. He asked: "Were the prices of steel rails to domestic consumers lower than to foreign consumers?"

Mr. Corey demurred at the question because it did not take into consideration freight rates.

Mr. Dickinson asked: "Were the prices at the mills lower to the foreign consumer than to the domestic?"

"Invariably," said Mr. Corey. He could not give figures, but, pointing to a great pile of Government exhibits, said that he supposed they were to be found somewhere in them.

Tennessee Company a Rail Competitor

Mr. Dickinson approached the Tennessee Coal & Iron question by reading a report of a meeting of the Carnegie Company managers, in which it was said that the railroads were reported as about to abandon Bessemer for open hearth rails, and the famous Harriman order was referred to which went to the Tennessee Company. A long list of questions followed about the two companies in which it developed that while the Tennessee Company had a nominal capacity for open hearth rails of 400,000 to 500,000 tons, until the completion of its Gary mills the Steel Corporation was equipped mainly to manufacture Bessemer steel. Mr. Corey admitted that the Carnegie Company talked about the Tennessee Company sometimes. Mr. Dickinson then read extracts from Carnegie Company minutes in 1903 to show that the Tennessee Company was selling steel rails at about \$2 above the agreed price, having certain freight advantages, and asked:

"Was the Tennessee Company at that time a competitor of the United States Steel?"

"I should say yes," answered Mr. Corey with a slight smile.

The "Pittsburgh base" rule which was enforced by the Steel Corporation was explained while the Tennessee Company was under discussion. The Pittsburgh base, Mr. Corey explained, was the prevailing price of a steel product at Pittsburgh, plus freight. Mr. Dickinson wanted to know how that worked out, say in the case of a St. Louis purchaser of steel at Youngstown. "Would the purchaser have to pay the Pittsburgh price plus the freight from that point instead of the freight from Youngstown, which is nearer St. Louis?"

"To the best of my recollection he would," answered Mr. Corey. He said that if Birmingham had been made a "base point" like Pittsburgh there would have been a considerable advantage to Southern consumers.

International Armor Plate Trade

Mr. Dickinson turned to the subject of an international armor plate pool. Mr. Corey at first said he could not say definitely whether there had been an armor pool since the formation of the Steel Corporation. Judge Dickinson read from the Carnegie minutes a discussion about a projected armor plant in Japan and a proposition for those "in the combination" to build one there in order to hold the market and prevent the consummation of the Japanese enterprise. Mr. Corey then recalled that the American members of the pool were the Carnegie and Bethlehem companies. He was not sure whether Midvale was a member or not. He said there was no armor pool now so far as he knew, and there was none when he retired as president of the corporation. The pool started, he said, considerably before 1902 and lasted till 1904 or 1905, which was when Judge Gary destroyed the pools. He did not know any of the details of the pool. That matter was in charge of the foreign representative at London, Millard Hunsiker, and W. W. Blackburn, secretary of the company, would probably know about it.

Mr. Corey said he had attended meetings of the structural and plate associations in effect from 1901 to 1904 or 1905.

"Was it known to the executive officers of the Steel Corporation that such agreements existed?" asked Mr. Dickinson.

Mr. Severance objected that the question was not definite as to what was meant by executive officers.

"Well," said Mr. Dickinson, "we'll find out. You were president at that time, Mr. Corey. Who was chairman of the board?"

"E. H. Gary," said Mr. Corey.

"Did he know about them?"

"Yes, he did."

"Were understandings reached at these meetings as to uniform prices?"

"Yes."

The Gary Dinners

The subject of the Gary dinners was brought up, and in answer to a question Mr. Corey stated that at the first Gary dinner in 1907 the general committee then chosen appointed sub-committees to represent the various branches of the industry. These independents and the United States Steel representatives controlled "by far the majority of the output in the country."

"Was not the purpose of those committees to agree on prices and output?" asked Mr. Dickinson. Mr. Corey had the question repeated, and then answered: "Yes."

"Did it bring about the maintenance of prices and the control of output?" was the next question.

"For a temporary period only."

"Were not you and the officials of the Carnegie Company in favor of an open market?"

"I want to answer that for myself alone. Personally I was in favor of the open market."

"Did your views prevail?"

"The prices were maintained somewhat longer than I deemed advisable."

"Maintained by co-operation?"

"Maintained by understanding, not by agreement."

Mr. Dickinson wanted Mr. Corey to distinguish between his idea of an agreement and such an arrangement as there was. He asked: "Were there understandings as to what the prices were to be?"

"There were."

"Were prices maintained as the result of these meetings?"

"They were."

The Hill Ore Leases

The Hill ore leases were taken up, and Mr. Dickinson asked if in the discussion it had been said that one of the purposes was to take that body of ore out of the market and keep it away from competitors. Mr. Corey said he had no recollection as to that.

"Did that consideration affect you?"

"Not at all. I was always opposed to making the leases on account of the price and conditions."

"Was the ore needed at that time for your operations?"

"No."

Mr. Corey said that in his opinion the price was at least double what the ore was worth.

Andrew Carnegie's answer to the suit brought by Henry C. Frick for a settlement of his interest in the Carnegie Steel Company was taken up and Mr. Dickinson read from the minutes that the answer was approved by the vote of Mr. Corey among others. This answer stated that the property was not worth \$250,000,000, as asserted by Mr. Frick, but was worth about \$75,000,000.

"Was that answer true?" demanded Mr. Dickinson.

"No value too high or too great could be put on the organization of the company."

Cross-Examined as to Rail Combination

On the next day, January 24, Mr. Corey was cross-examined by the corporation's attorneys, chiefly Mr. Severance. Referring to the steel rail pool, broken up in 1904, he asked:

"And from the time it was broken up, there was no agreement between the rail manufacturers to increase, maintain or reduce prices?"

"There was not."

"And did not rail-makers of the country at times want to raise prices, and the corporation refuse?"

"I heard suggestions to that effect."

With regard to the Tennessee Company, Mr. Severance asked: "Outside of steel rails, did the United States Steel Corporation consider the Tennessee Company as a competitor?"

"It did not. Outside of rails its output was infinitesimal."

Value of the Tennessee Property

Mr. Corey said he made an inspection of the Tennessee property after its acquisition and reported to the finance committee that it would take \$5,000,000 a year for five years to put it in shape. After that it might be a dividend payer. Mr. Severance also brought out that after the Tennessee Company had delivered the Harriman order of 157,500 rails, which put it into business as a rail competitor, there was much complaint about their quality.

"Didn't a large part have to be taken back?"

"Some were taken back."

"Didn't it cost the Tennessee Company more to make the rails than the current price?"

"I can't say that positively. I know the cost was very high."

"Under those circumstances would you say that any competitor could continue to amount to anything in the general competition of the country?"

"My opinion," said Mr. Corey, "is that the competition in rails would have continued."

"Assuming that they couldn't make the rails at a profit?"

"I would still be of the opinion that competition would have continued. Within a short time, with the improvements they were putting in, I think they would have been able to reduce the costs. Furthermore, they were putting a 'nuisance value' on the property and would have gone on for a long time."

Mr. Severance tried to show that John W. Gates tried to sell the Tennessee property to the Steel Corporation, but Mr. Corey said he had never offered it.

"When I happened to meet him, not by appointment," he said, "Mr. Gates called my attention to the value of the Tennessee Coal & Iron stock. I don't recall that he ever suggested that we should purchase it. It was his opinion that the stock was cheap at \$250 a share."

"Did he intimate that the Steel Corporation ought to own the property?"

"That was his idea, but I don't think he ever said so. I told him he was about \$200 too high in his valuation of the stock."

Mr. Corey said he opposed the purchase of the Tennessee Company at the conferences at J. P. Morgan's library in the panic, but finally voted for it, without changing his opinion of its value.

Competitors Grew and Flourished

Mr. Severance got into the record the statement that in Mr. Corey's presidency the Steel Corporation's competitors "grew and flourished like a green bay tree," and that despite the absorption of the Tennessee Company, the acquisition of the Union Steel Company and the construction of the Gary plant, the Steel Corporation had a smaller percentage of the country's output of finished steel

products in 1910 than at its formation. The consumption of the country, Mr. Corey said, had doubled in the ten years.

Mr. Severance took up the pools which were abandoned in 1904 and 1905, and brought out that they were broken up by advice of counsel not connected with the Steel Corporation. After consultation with Judge Gary, Mr. Corey said, he instructed the officers of subsidiaries to wipe out anything that might be considered illegal by counsel.

"The rail pool was wound up at the same time?"

"The domestic rail pool, yes."

Says Judge Gary Knew About All Pools

"Did you mean to say yesterday that Judge Gary knew about these pools, or merely about the rail pool, at or about the time they were wound up?"

"He knew about them all the time."

"Are you sure of that?"

"Absolutely."

"How do you know he knew about them?"

"Because he attended the meetings."

"What meetings did he attend outside of the rail pool?"

"The plate and structural pools."

Mr. Severance wanted to know when Judge Gary had attended. Mr. Corey said he couldn't fix the exact date, but he remembered a meeting at the Waldorf in 1902 or 1903. This was while he was president of the Carnegie Steel Company, before he became president of the Steel Corporation.

"Do you feel sure about that?"

"That is my recollection."

"But do you feel sure?"

"I do."

"Was this a meeting at which prices were fixed?"

"It was one of the regular meetings. I can't recall definitely whether prices were fixed."

"Would you undertake to say prices were discussed when Judge Gary was there?"

"Yes."

"When you talked with Judge Gary about winding up the pools, don't you remember him expressing surprise at learning of them?"

"As to the Bridge Company, yes."

"You still feel sure that he attended the structural and plate pool meetings?"

"I certainly do."

Why Mr. Corey Resigned

Mr. Severance's next move was to show that Mr. Corey hadn't the kindest feelings toward Judge Gary.

"During the latter part of your presidency," he said, "you were not at all times in accord with Judge Gary, were you?"

"I don't know that I care to answer that," said Mr. Corey.

"When you left the Steel Corporation, you went away with some feeling against Judge Gary, did you not?"

"We were not always in accord concerning policies, but I don't know that there was any particular feeling."

"Was your feeling cordial toward him?"

"I won't say it was as cordial as it had been previously," admitted Mr. Corey. He said there had been some disagreements as to the question of whether the authority of the president or that of the chairman was superior, and that the matter had been submitted to the finance committee, which supported Judge Gary. This was in January, 1910, and Mr. Corey resigned at the end of that year.

Hill Attorney Cross Examines on Value of Leases

Mr. Corey was next taken in hand by F. R. Kellogg, representing the Great Northern Ore Trustees, the other parties to the Hill ore leases. Mr. Kellogg tried for half an hour to get Mr. Corey to admit that the leases were worth more than 50c. per ton royalty. He asked his questions over and over in slightly different form, while Mr. Corey plainly showed his exasperation.

Mr. Kellogg's point was that Mr. Corey didn't take into consideration that the Steel Corporation got the privilege of working the most advantageous parts of an ore body of 250,000,000 tons, and that he had compared the price with that of relatively small leases. He also sought to show that Steel Corporation subsidiaries had made less

advantageous leases at 75c. a ton. The Hill royalties were in the neighborhood of \$1 a ton.

Mr. Kellogg took up other leases and asked Mr. Corey about their terms, the quality of the ore and its percentage of metallic contents. Most of the leases Mr. Corey didn't even remember. If Mr. Kellogg's facts were correct they wouldn't change his opinion a particle, he said.

Part of Mr. Corey's Fortune in Steel

Re-direct examination of Mr. Corey was taken up by Mr. Dickinson on Monday, January 27, who questioned the witness concerning his differences, before his retirement, with Chairman Gary.

"Are you pecuniarily interested in the United States Steel Corporation?" he was asked.

"One-fourth of my fortune is in the securities of the Steel Corporation," replied Mr. Corey.

"Are your personal feelings favorable or unfavorable to the success of this suit?"

"I am naturally favorable to the Steel Corporation. I am opposed to the Government in this case."

C. A. Severance, for the defense, brought out the statement that in this attitude Mr. Corey was actuated by his idea of the justice of the suit rather than by his pecuniary interests.

Mr. Dickinson dropped the line there and went into another.

"From your knowledge can you tell me whether the United States Steel Corporation is able to make rails cheaper than its competitors?"

"Yes; in my opinion the company can make rails cheaper than its competitors."

"Did the understanding with the foreign manufacturers tend to raise the price of rails abroad?"

"I can't state positively that it did, but such an understanding would in all likelihood have that effect."

"When did this agreement occur, before or after the American invasion?"

"I have never said there was an agreement. I have said that I understood that there was one."

"Well, was the general object of pools to increase competition?"

"Pools are not to increase competition."

Mr. Dickinson switched to the acquisition of the Carnegie Steel Company by the Steel Corporation.

Mr. Corey said he did not think the manufacturing costs of the Carnegie Steel Company had been lowered since it had become part of the "trust."

Cross-examined by Mr. Severance, Mr. Corey testified that after the panic of 1907 the Steel Corporation had refused to reduce the wages of its employees, although requested to by other manufacturers who had made reductions.

"We haven't gone into the question of labor," said Mr. Dickinson, objecting on the ground that the question was irrelevant.

"No, you don't dare to," retorted the attorney for the defense.

Walter Scranton Testifies

Walter Scranton, formerly president of the Lackawanna Steel Company, was then called. After telling of various steel rail pools, he said that at one time there was a pool within a pool by which there was an understanding between the Carnegie Steel Company and the Illinois Steel Company that was not known to the other members.

"How did you come to know about that?" asked Henry E. Colton, counsel for the Government.

"They had some kind of a disagreement and they asked the rest of us to appoint a committee to arbitrate it. I don't remember what the difficulty was."

Some of the members didn't stick very well to the prices made by the pools, and the intimation was that Mr. Carnegie was one of these.

"Did Andrew Carnegie's methods of competition give rise to any feeling on the part of the other manufacturers in respect to his continuance in the rail business?"

"There was a general feeling that it would be a godsend if Mr. Carnegie was out of the rail business."

"Did that extend to other branches of the industry?"

"I can only speak of the rail business."

Mr. Scranton testified that Judge Gary took part in the meetings of the rail pool as the representative of the Federal Steel Company before the formation of the United

States Steel Corporation. He said his company withdrew from the existing pool in 1897.

"In that pool was there any agreement as to prices?"

"Yes."

"After you withdrew what happened to prices?"

"Rails sold down to about \$14, away below cost."

After this period of price cutting came the proposition to organize the Empire Rail Company of New Jersey to handle the output of the competing manufacturers.

"Was that plan carried out?"

"No. One of the companies disagreed."

This, it turned out, was the Carnegie Company, and the disagreeing was done by Andrew Carnegie.

"While you were out of the pool was there a pool among other manufacturers?"

"Yes; it included the Carnegie, Illinois, Pennsylvania, Cambria and Maryland companies."

Mr. Scranton said there was another pool, of which he was a member, between 1897 and the formation of the Steel Corporation. He didn't remember any agreement as to prices in this pool.

"Was a common price arrived at from time to time?"

"Yes, we would meet and suggest certain prices, but they varied from time to time. We would bring up inquiries, as among gentlemen, and ask each other, 'What do you think the price ought to be?' The suggestions were often followed; often they were not."

"If the manufacturer didn't follow the suggestion would you consider that he was living up to the understanding?"

"No."

"Did the Steel Corporation, through the acquisition of the Carnegie, Federal and National steel companies, acquire such a percentage of the capacity for making rails that it could practically control their price?"

"I don't think it could control the price, but naturally its suggestions as to prices would be carefully considered by the other companies."

Mr. Scranton did not think prices could have been raised with one large member out. "They had to have a common agreement among them all," he said.

"Don't you think a common price could be maintained without an agreement?" asked Mr. Colton, evidently having in mind the contention that they have been so maintained.

"It would be rather difficult," said Mr. Scranton.

"If they were maintained at \$28, would you assume that there was some understanding?"

"I should think there was some understanding."

David A. Reed, for the Steel Corporation, brought out that when the price went to \$14 the most aggressive competitor in the field was Mr. Carnegie.

Prof. John B. Grasty on the Stand

Prof. John B. Grasty, who holds the chair in geology at the University of Virginia, told about the proportion of Alabama ore acquired in the purchase of the Tennessee Company. He qualified as an expert and testified that he made an examination of the Alabama ore fields for a Baltimore syndicate in 1907. He declared that in the Birmingham district in a radius of 25 miles were the best situated ore beds for commercial purposes in the world, so far as he knows. This was not only because of the grade of ore, but because coking coal and fluxing stone, limestone were contiguous; they were all within a 12½c. freight rate.

From his examination he was able to say that of the 600,000,000 tons of iron ore commercially available in 1907, the Tennessee Company controlled about 400,000,000 tons.

Ex-President Roosevelt Examined

Before beginning Mr. Corey's examination, ex-President Theodore Roosevelt was heard with regard to his part in the acquisition of the Tennessee Company in the panic of 1907. His testimony was a reiteration of his statements before the Stanley Committee. He was examined at considerable length, but maintained the position he took then, saying: "Not one thing could have been known about the Tennessee Company which could have altered my action. I was dealing with a panic."

The improvements on the Star Furnace Company's furnace at Jackson, Ohio, amount practically to a rebuilding. The furnace will be blown in on the completion of the work, probably before the end of February.

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Steel Prices and Profits

The United States Steel Corporation's earnings for the last quarter of 1912, roundly \$35,000,000, were 100 per cent. more than those of the first quarter of last year, and 30 per cent. more than the average for the four quarters. They give some indication of the excellent footing the steel industry had attained in the latter part of a year that at its beginning promised fairly in volume of business but miserably in profits. If four quarters of such profits as are reported this week could be assured the Steel Corporation in 1913 the year would be considered a successful one, under all the conditions, and such a result is not an unreasonable expectation. It will mean either a higher average price for the product of this year than was secured on shipments in the last quarter of 1912, or a greater rate of output, or both, since a labor cost of \$1,000,000 more per month must be provided for in view of the advances in wages that are just going into effect.

The strongest impression conveyed by the market developments of the past year, month after month, was that of increasing consumption and a fairly continuous procession of price advances. But as earnings have been reported by the large steel companies, they have shown plainly that 1912 was no exception to the rule that in all periods of advancing prices in steel products the effect of the successive increments in adding to the cost of material entering into consumption is greatly exaggerated in the common thinking. To illustrate: While structural steel, bars and plates—taking contract prices, and not prices for early delivery—advanced about \$7 a ton from low point last year, the average price on contract shipments in these three lines for the year was probably less than 1.20 cents, or, say, \$2.50 a ton above the low contract basis of the early months of the year. A similarly misleading impression of increasing profits is given by the pig iron market. In the case of Southern iron, while sales in the late months of the year were \$4 higher than at its beginning, the record of invoices of one firm, as cited in our review of the Cincinnati market in 1912, showed an average of \$10.35 Birmingham for No. 2 foundry iron in January and \$11.40 in November, or an advance of but \$1.05.

If no conditions arise leading to cancellations of business now on the books—and such a development seems highly improbable now—there should be further increases in the earnings of the steel companies as they advance into 1913. Present contract prices have been in force in heavy lines since the beginning of the fourth quarter, it is true, but in plates, shapes and bars, large shipments are yet to be made at 1.20 cents to 1.30 cents for the first two and 1.15 cents to 1.20 cents for bars. It is to be noted that under maintained prices the Steel Corporation earnings in 1910 were \$141,000,000, or just at the rate of the fourth quarter of 1912, but it took nearly 50 per cent. greater production in the latter period than the average for the quarters of 1910 to bring earnings up to a similar basis.

We have commented before on the exaggerated popular notion of the profits of the steel industry derived in large part from the high finance of the consolidations. The year 1912, with its Stanley Committee hearings, its dissolution suit and its war upon the tariff, did more than any other year to impress upon the public mind the enormity of steel-making profits in adding to the burden of high cost of living. As-

suming that the Steel Corporation turned out half the steel produced last year and that its profits were half the total (they were more than half, as is well known), we have a basis for computing the steel trade's burden. Roughly its profits were \$2 per capita. After deducting what even the "physical valuation" experts of all sorts and conditions would consider a fair return to the investors in the various steel stocks, the 1912 addition of the entire industry to the high cost of living would probably be represented by some negligible fraction of a dollar per unit of population!

Record Year for Exports and Imports

The foreign trade of the United States in the calendar year 1912 totaled \$4,217,658,313—\$2,399,995,973 exports and \$1,817,662,340 imports—according to the statement just issued by the Bureau of Foreign and Domestic Commerce of the Department of Commerce and Labor. This is an increase of almost \$600,000,000 over 1911, when a new record was established in our foreign trade. The exports of merchandise in December were considerably larger than had ever been attained in that month in any year, amounting to \$251,093,787. The imports were also much larger than for any preceding December, having been \$153,580,429. The excess of exports over imports in December was \$97,513,358, and in the calendar year it was \$582,333,633.

The magnificent showing thus made is commended to the attention of those who hold the opinion that our trade with other countries is throttled by the tariff on imported merchandise. In the last five years our foreign trade has increased almost \$1,400,000,000, but the fact is worthy of special consideration that it has increased by leaps and bounds in the 15 years covered by the Dingley and Payne tariff acts, which have been charged by tariff revisionists as obstructing our progress. The Dingley act went into effect July 1, 1897. In the fiscal year ended June 30, 1897, our foreign trade was but \$1,815,723,968. The figures for the calendar year 1912 are \$2,401,934,345 greater, showing a gain of over 132 per cent. It is conceivable that the growth might have been greater under such conditions as favorable reciprocity treaties or better facilities for reaching South American countries, but it has certainly been large enough to prove that existing duties have been far from hindering the development of foreign trade.

New Life for the Contract Machine Shop

The contract machine shop has resumed the position in the metal industry which it occupied a generation ago. Its importance waned rapidly for a while and not many works of the sort survived; but conditions quite different from those which formerly made it an institution have now given it a new vitality. To-day it is a plant devoted to specialized product which it undertakes to manufacture as cheaply and otherwise as advantageously as its customers could do the work for themselves. Instead of being a jobbing shop, as it formerly was when measured by present day standards, it is exactly the reverse; for, while there are exceptions, its purpose generally is to manufacture on a large scale. A vital advantage to the metal industry is the contract shop's ability to supplement the work of plants which are crowded beyond the limit of their capacity. It will produce practically everything that can be manu-

factured on metal-working machinery, to meet the needs of customers without excessive expense to them. Its engineering staff is trained to handle widely miscellaneous problems. The tool-making department is much more important and on a very much larger scale than in the ordinary manufacturing establishment. As a producer for others the purpose is to make money both for the customer and for the shop itself.

The Importance of the Mailing Department

The mailing department of the manufacturing house has become a factor of no small importance. Much more attention than formerly is paid to sending out mail matter to buyers and agents, as well as to the general list of correspondents. The manufacturer has an increasing pride in his effort to make a favorable impression on buyers through his letters and literature. It is necessary therefore that the mailing department do its work skilfully and neatly. Examples of slackness on the part of the clerks are common enough. Finely executed photographs of equipment or circulars containing handsome half-tone engravings are sent out folded, destroying much of their value, since folding a picture causes a distortion of its lines. To smooth it out again satisfactorily is usually impossible.

Trouble may follow carelessness in weighing mail matter; insufficient postage may cause delay. The parcel post will be used in a large way by manufacturers, and it will have pitfalls for the clerk who is not made perfectly familiar with its regulations. A letter makes a better impression if the stamps are affixed symmetrically, instead of angularly or upside down. A slovenly parcel is a poor advertisement of office efficiency. Responsible heads should find it worth while to make a personal inspection once in a while of the outgoing mail after it is made ready for the postoffice.

Paying Labor by the Hour or by the Day

The practice of hiring men by the hour instead of by the day has made a good deal of progress, but there are still many works where the day rate remains. With a working schedule of 10 hours the disadvantage of the daily rate is not very great, but with the reduction to a nine-hour or an eight-hour day the drawbacks are obvious, especially in the maintenance of a cost system, because of the endless fractional multiplications. With a 10-hour schedule the \$2 a day man gets an even 20 cents an hour, and the hourly rate for the \$1.75 or the \$1.40 man is not a cumbersome unit. But if a \$2 a day man works nine hours his pay for an hour is the awkward figure of 22 $\frac{2}{9}$ cents and that of the \$1.75 man is 19 $\frac{4}{9}$ cents. Supposing a workman is occupied 7 $\frac{1}{3}$ hours at 22 $\frac{2}{9}$ cents, the necessary multiplication requires undue time on the part of a clerk, unless the office is equipped with a machine especially designed for multiplying fractions, and many small works do not possess this convenience. To multiply these two figures is to produce as a result \$1.62 $\frac{26}{27}$ cents. On the other hand, if the man worked for 22 cents an hour the calculation would be very much less expensive in its demand upon office time.

Simplification of detail is always profitable in industrial management, and this is accomplished in the change from the daily to the hourly rate, as has been proved in the offices of many plants where less than 10

hours constitutes a day's work. In making the change the man receiving a \$1.75 wage may be given 20 cents an hour for a nine-hour day, a \$2 man 22 cents an hour and so on, averaging the pay roll neither to increase nor decrease its total, and to do no injustice to employees.

In some manufacturing centers the old custom is not easy to overcome. The workman has always considered his earning power in the unit of a day and he does not like to make the change. Consequently in busy times the difficulties of altering the policy may be too great to make the attempt worth while. But planning for the change at some later day may be profitable.

Isaac W. Frank on German Conditions

Machinery Manufacturers There Expect to Profit by American Tariff Reductions

In response to the request of *The Iron Age* for comment on the industrial situation at home and abroad in the light of impressions gained in his recent trip to Europe, Isaac W. Frank, president United Engineering & Foundry Company, Pittsburgh, writes as follows:

"During my seven months in Europe I met with numbers of manufacturers in the iron and steel as well as in the machinery and machine tool industry. The first inquiry before the election was, 'Who will be the next President of the United States?' which in every case led to the hope that Mr. Wilson would be elected; and after his election gratification was expressed, as the German manufacturers particularly are keenly interested in export business and are wide awake to any opening that will be made by a reduced tariff in the United States. They expressed the confident belief that, if the tariff were put on anywhere near the basis of the Underwood bill of the last session of Congress, they would have a wide market in the United States for their products. They were inclined to believe that even a much modified bill would result to their great benefit.

"When a visit is paid to German manufacturing establishments, the average American loses much of the conceit with which he left home, and begins to realize that Germany is a factor to be reckoned with. Great changes have taken place in the industries of Germany, which ten years ago was an agricultural country. It has not lost its agricultural activity, but has gained immensely in manufacturing, and whereas thousands of Germans formerly came to our shores, they are now remaining at home, finding remunerative employment in the manufacturing industries. When I say 'remunerative employment,' I mean a large advance over what was paid ten years ago, but still less than one-half of what our labor of like character receives. When it is taken into consideration that the best mechanics of Germany receive \$1.75 for ten hours, while ours receive from \$3.50 upwards for eight and nine hours, it is plain that when man for man and hour for hour, the German will produce as much on their very modern machine tools, high speed steels and scientific management as establishments in our own country, they will be able to compete easily if the tariff is lowered to any considerable extent.

"I was impressed most profoundly by the systematic, efficient and highly scientific treatment of all matters pertaining to manufacturing, and also with the commercial training in the accounting and sales departments. They have been apt students of our methods of accounting and manufacturing. They have bought, and are now manufacturing, with many improvements, the very tools that we formerly boasted of as purely an ingenious American product. They are alive to competitive principles, and this is fostered by the government itself. It offers large inducements to export business by heavily reduced railroad rates to the seaboard, and is encouraged from the Emperor to the peasant in every manner possible, believing in the principle that all goods sold outside of the country, even though it be at a cost price, is for the great benefit

of Germany, using its raw material and employing its labor steadily. This differs so widely from the principles believed in by our Representatives in Congress and the Senate, and by many professional men in our country, it is surprising that our solons should be so dense as not to see the advantage derived from such export business. Steady employment of men and machinery enables the lowest cost of production to be secured, which must eventually reduce the price to the home consumer to a point lower than that which could be made if the industry works but spasmodically. Germany appreciates the home market fully and is protecting it by an ample duty, much on the principle of our own protective tariff. The wisdom of this is shown by the unprecedented prosperity of the German nation.

"I am not pessimistic as to the final result of the changed policy with reference to the tariff in this country, but am hopeful that the Democratic party will see that our own great industries cannot be ruthlessly disturbed by a radical reduction of the tariff without adversely affecting the entire people of the United States."

An Association to Foster Corporation Schools

At a meeting which was attended by representatives of 53 business firms, corporations and educational institutions, held at New York University, Washington square east, New York, January 24, was completed the organization of the National Association of Corporation Schools, the object of which is to foster the maintenance of schools for employees by corporate and other business enterprises and to render more effective those which already exist. The charter members of the association represent 31 different industries.

It was explained at the meeting that for a number of years many large corporations have been conducting schools for their employees—to fit them better for their duties, prepare them for advancement and give them a broader education, and that a need had arisen for greater co-operation in such work. The organization just formed will gather and arrange in correlation all kinds of data concerning such schools, not only for the benefit of those already established, but to facilitate the formation of new ones and the elimination of misconceived plans which are expensive in time and money. In the course of the meeting, which lasted all day and was followed by a banquet, the following officers were elected:

President, Arthur Williams, New York Edison Company; first vice-president, E. St. Elmo Lewis, Burroughs Adding Machine Company; second vice-president, Dr. Charles P. Steinmetz, General Electric Company. Executive committee: A. F. Bardwell, Yale & Towne Mfg. Company; J. W. L. Hale, Pennsylvania Railroad Company; M. N. Mix, Dodge Mfg. Company; E. C. Wolf, Curtis Publishing Company; William D. Kelley, Consolidated Gas Company of New York; C. R. Dooley, Westinghouse Electric & Mfg. Company; G. M. Basford, American Locomotive Company; J. E. Rogers, National Cash Register Company, and F. C. Henderschott, New York Edison Company.

A general education committee, which is divided into four sub-committees, was appointed. The sub-committees will gather and collate information embracing technical commercial training, salesmanship and accounting methods. On these subjects reports will be rendered to a national convention of the organization. Meanwhile an executive secretary and headquarters will be maintained in New York. The membership is made up of commercial, industrial, transportation or governmental organizations, whether under corporate, individual or firm ownership; also educators and others interested. Three classes of members are provided for: Class A, made up of corporations which are conducting schools. Class B, instructors and others connected with such schools. Class C, consisting of those interested but not directly engaged in the work. Only Class A is permitted to vote, thereby leaving control of the body in the hands of the corporations most interested.

The meeting was called to order by Professor Lee Galloway, New York University. Addresses were made by E. J. Mehren, *Engineering Record*; Henry C. Gamer,

National Cash Register Company; F. C. Henderschott, New York Edison Company, and Dr. Charles P. Steinmetz, General Electric Company. The speakers at the banquet on the evening were Arthur Williams, chairman of the Public Policy Committee of the National Electric Light Association; Chancellor E. E. Brown, New York University, and E. St. Elmo Lewis.

Among the companies or institutions represented at the conference, besides those already mentioned, were the Commission of Education of New Jersey, Western Electric Company, American Institute of Electrical Engineers, College of the City of New York, Merchants' Association of New York, Tide Water Oil Company, Westinghouse Air Brake Company, Tufts College and Teachers' College of Columbia University.

Fluctuations in Eastern Blast Furnace Wages

The recent announcement of an advance of approximately 10 per cent. to the blast furnace employees of the Thomas Iron Company, Hokendauqua, Pa., and the Crane Iron Works, Catasauqua, Pa., makes interesting a comparison of wages prevailing at the furnaces of these companies in the past half dozen years. This shows that the wages now paid are the highest on record at these furnaces. Common labor is now paid nearly 7 per cent. more than at high point in 1907, while blast furnace keepers and fillers receive practically the same wage as at the high point before the panic. The daily wage rates established at different times, beginning with February, 1906, are as follows:

	Keepers	Fillers	Common Labor
February 1, 1906.....	\$2.36	\$2.10	\$1.37½
January 1, 1907.....	2.59	2.31	1.50
December 1, 1907.....	2.36	2.10	1.37½
January 16, 1908.....	2.15	1.90	1.25
April 1, 1909.....	1.96	1.75	1.20
August 1, 1909.....	2.15	1.90	1.25
October 1, 1909.....	2.36	2.10	1.37½
January 16, 1911.....	2.15	1.90	1.35
June 16, 1912.....	2.36	2.10	1.50
January 16, 1913.....	2.60	2.31	1.60

The advance of 10 per cent. announced this month by the two companies was made to apply to their iron mines in New Jersey, though no demand had been made by the miners as was the case with the blast furnace workers. In voluntarily increasing wages at the mines, the companies sought a readjustment of hours, including time of entering and coming out of mines, but this the men opposed. At the Mount Hope mine some of the workers struck, but all returned to work January 24. At the Richard mine the men were still out on that day.

Steel Corporation Pensions in 1912

The statement of the United States Steel Corporation concerning the amounts disbursed by its subsidiaries in 1912 under the pension plan announced two years ago shows a total of \$358,780. In 1911 it was \$281,458, making the total for the two years \$640,238. At the beginning of 1912 there were 1606 active cases, while 363 were added in the year. The pensions discontinued numbered 126, so that 1843 were continued into 1913.

The average age of the pensioners is 63.69 years and their average length of service has been 29.14 years. The monthly average pension received was \$20.30. The largest disbursement was to employees of the American Steel & Wire Company. To former employees of the company's 28 plants the amount paid out was \$96,494. Former employees of the Carnegie Steel Company received \$92,624.

Steel Corporation Not Seeking Dissolution

In view of rumors recently circulated, that the United States Steel Corporation would apply to the United States Supreme Court for directions concerning dissolution, Chairman E. H. Gary gave out the following statement last week:

"There is no foundation whatever for the published statement that 'the Steel Corporation is going to seek voluntary dissolution, and that it will apply to the Supreme Court for directions how to go about it. The question has not been up for consideration by the Board of Directors, or the Finance Committee, or the officers of the Steel Corporation."

Steel Corporation Earnings in 1912

Total for 1912 Was \$108,178,307

Against \$104,305,466 in 1911

The statement of its earnings for the last quarter of 1912, just issued by the United States Steel Corporation, enables approximate figures for its total earnings of the year to be made up. Adding the results of the last quarter to those given for the previous quarter, the total is \$108,178,307, showing an increase of \$3,872,841 on the earnings of 1911. The figures for 1912 may be changed slightly upon completion of the audit of accounts for the year. The quarterly statement of earnings given below compares the last quarter of 1912 with the last quarter of 1911:

	1912.	1911.
October, earnings	\$12,485,412	\$9,159,338
November, earnings	11,120,749	6,946,717
December, earnings	11,579,396	6,999,060
Total after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants and interest on bonds and fixed charges of the subsidiary companies	\$35,185,557	\$23,105,115
Less charges and allowances for depreciation: Sinking funds on bonds of subsidiary companies and depreciation and extraordinary replacement funds.....	7,786,216	3,126,594
Sinking funds on U. S. Steel Corporation bonds:		
Installments	1,012,500	1,012,500
Interest on bonds in sinking funds.	621,915	547,783
Net income	\$25,764,926	\$18,418,238
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding...	5,677,547	5,751,680
Balance	\$20,087,379	\$12,666,558
Net adjustments in sundry accounts...	-17,698	+81,780
	\$20,069,681	\$12,748,338
Dividend for the quarter on preferred stock, 1¼ per cent.....	6,304,920	6,304,919
Dividend for the quarter on common stock, 1¼ per cent.....	6,353,782	6,353,781
Surplus for the quarter.....	\$7,410,979	\$ 89,638
The net deficit for previous quarters in 1912 was \$3,800,850. The surplus for the year was, therefore, \$3,610,129, against \$4,665,495 in 1911.		

Further Buying of Electric Steel Rails

The recent purchase of 1500 tons of electric steel rails by the Pennsylvania Lines from the Illinois Steel Company, in addition to a 500-ton lot which has been in service on this road for some months, and the ordering last week of 1000 tons of similar rails by the Erie Railroad, follow uniformly satisfactory results from the various tests that have been made of such rails. During the past two years the Lake Shore & Michigan Southern, the Chicago, Milwaukee & St. Paul, the Union Pacific, and the Chicago & Northwestern railroads have had electric rails in service under test. These were placed at the points where traffic conditions were most severe—at curves and on sections of the track where speeds were highest. Throughout the severe winter of a year ago when rail failures were so frequent, not a single instance of electric steel rail breakage was reported. A few failures developed, due to easily remediable causes. The Illinois Steel Company also made interesting tests of the rail at its open pit mines in Minnesota, where the practice of allowing the empty trains to run free into the pit to be checked up sharply at the bottom of the incline subjects the rails to exceptionally severe usage.

The fact that the carbon in the electric steel rail can be brought up as high as 0.70 without inducing any tendency to breakage is the key to the exceptional wearing qualities shown by the electric rail in service. It is even anticipated that the carbon content may be raised an additional ten points. In comparison with the standard Bessemer rail the results with respect to wearing qualities are particularly gratifying. The control possible with the electric furnace offers the added advantage with reference to ordinary rail specifications that whereas a variation range of fifteen points in carbon is reserved by the maker, specifications for electric rails are guaranteed within five points.

Until about a year ago these electric rails were offered for testing purposes at approximately the price of open-hearth rails. More recent sales have been on the basis of about \$10 above that price.

The Iron and Metal Markets

Railroads Still Buying

Prospective Car Business Growing

Further Sales of Rails—Pig Iron Lower in Several Markets

In pig iron quietness with some weakness and in steel products great strength with some slowing down in the rate of new orders are continuing features of the market. Accompanying the announcement of earnings of the Steel Corporation for the last quarter of 1912 is the statement that orders this month have fallen behind those of December. It has been noticed, however, that in the last week of every month a good deal of business comes on the books that had been hanging fire.

Sellers of finished products still tell of their desire to reduce their obligations rather than add to the total, and the market is in a situation where more business could be done if sellers were disposed to urge it. The practical certainty that a good many deliveries promised for the second quarter will go over into the third seems to have more to do with restricting business than any opinion of buyer or seller as to conditions that will prevail after the middle of the year.

The open winter has brought an unexpected call upon the mills for deliveries of structural material and concrete bars and there has been more pressure in other lines rather than the easing up that was to be expected.

The railroads are bearing out all that has been said lately of large requirements yet to come. Pittsburgh steel companies have just been asked to quote on material for 20,000 cars, 12,300 being for the Pennsylvania Railroad and the remainder for the Norfolk & Western. The Chicago & Northwestern is also preparing a large equipment order. The Rock Island has bought 1500 cars and 55 locomotives and has yet to place an equal amount. The Wheeling & Lake Erie has bought 1500 steel hopper cars, for a part of which 4000 steel wheels are under contract. It is now estimated that inquiries for 60,000 cars are pending or are about to come on the market.

The Great Northern has placed supplemental rail orders of 5000 tons each with the Cambria, Bethlehem and Pennsylvania steel companies, and is expected to buy 15,000 tons more. The St. Paul will need upward of 50,000 tons for new work. An interesting development in electric steel rails is the sale of 1000 tons to the Erie following a recent sale of 1500 tons to the Pennsylvania Lines West. Carbon runs above 0.70 and a premium of several dollars above the open hearth price is obtained.

The Argentine government inquiry for 150,000 tons of rails has come up again in a way indicating that European mills can do little on the deliveries desired this year. This country will take the bulk of the order. A recent sale of several thousand tons was made by a home mill to the Canton & Hankow railroad in China.

Structural mills in the interval of waiting for the large New York elevated and subway contracts are getting a multitude of small orders. An advance in structural steel has been rumored, but while some mills have taken contracts at 1.50c. Pittsburgh, as has been the case for some time, the 1.45c. basis persists and is not likely to disappear.

New buying of bars in the East is reported, including the yearly contract of one important manufacturing company, and some jobbers are buying for the third quarter. In reinforcing bars recent business has been

of good size. At Cleveland bar iron mills have advanced the price to 1.65c.

Lower prices on some recent pig iron sales raise a question as to the basis of the next buying movement, which may be delayed some weeks. Southern iron has sold rather more freely at \$13.50, Birmingham, for No. 2, though Alabama producers, with perhaps one or two exceptions, hold to \$14. For the first time in many months Southern iron has been sold at Cleveland at less than local iron.

Southern Ohio iron has invaded the northern part of the State, unusual concessions being made in the price. In New Jersey a sale has attracted attention which was at 50 cents under the recent basis. Chicago reports transactions in local iron at 50 cents under December quotations.

The outcome of such yielding of prices in a time of light buying will be closely watched. Pig iron consumption appears still to be fully up to production and the aspect of the market might change quickly under any considerable demand. Buyers, however, seem more disposed to hold off.

The strike at the Port Henry, N. Y., iron mines has reduced shipments and some Eastern furnace companies have been looking about for prompt ore. Working forces have increased this week and are now nearly two-thirds normal.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Jan. 29, 1913.	Jan. 22, 1913.	Dec. 24, 1912.	Jan. 24, 1912.
Pig Iron, Per Gross Ton:	1913.	1913.	1912.	1912.
Foundry No. 2 X, Philadelphia	\$18.50	\$18.50	\$18.50	\$14.85
Foundry No. 2, Valley furnace	17.50	17.50	17.50	13.00
Foundry No. 2 S'th'n, Cin'ti...	16.75	16.75	17.25	13.25
Foundry No. 2, Birmingham, Ala.	13.50	13.50	14.00	10.00
Foundry No. 2, furnace, Chicago*	17.50	18.00	18.00	14.00
Basic, delivered, eastern Pa....	18.00	18.00	18.25	14.25
Basic, Valley furnace	16.35	16.35	16.50	12.25
Bessemer, Pittsburgh	18.15	18.15	18.15	14.90
Malleable Bessemer, Chicago*	17.50	18.00	18.00	14.35
Gray forge, Pittsburgh	17.15	17.15	17.15	13.40
Lake Superior charcoal, Chicago	18.00	18.00	18.75	16.00

Billets, etc., Per Gross Ton:	28.50	28.50	27.00	20.00
Bessemer billets, Pittsburgh...	29.00	29.00	28.50	20.00
Open hearth billets, Pittsburgh	36.00	36.00	35.00	28.00
Open hearth billets, Philadelphia	32.00	32.00	32.00	22.40
Wire rods, Pittsburgh.....	30.00	30.00	30.00	24.50

Old Material, Per Gross Ton:	16.75	16.75	17.25	15.00
Iron rails, Chicago.....	18.00	18.00	18.00	16.50
Iron rails, Philadelphia.....	16.75	16.75	17.00	13.25
Car wheels, Chicago.....	16.25	16.25	16.00	12.00
Heavy steel scrap, Pittsburgh...	14.75	15.00	14.75	12.75
Heavy steel scrap, Chicago....	12.50	12.50	12.50	10.50
Heavy steel scrap, Philadelphia	14.00	14.50	14.50	12.00

Finished Iron and Steel,				
Per Pound to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill...	1.25	1.25	1.25	1.25
Iron bars, Philadelphia.....	1.67½	1.77½	1.67½	1.27½
Iron bars, Pittsburgh.....	1.70	1.70	1.70	1.25
Iron bars, Chicago.....	1.57½	1.57½	1.57½	1.15
Steel bars, Pittsburgh, future...	1.40	1.40	1.40	1.15
Steel bars, Pittsburgh, prompt...	1.70	1.70	1.70	1.15
Steel bars, New York, future...	1.56	1.56	1.56	1.31
Steel bars, New York, prompt...	1.86	1.86	1.86	1.31
Tank plates, Pittsburgh, future	1.50	1.50	1.50	1.15
Tank plates, Pittsburgh, prompt	1.75	1.75	1.75	1.15
Tank plates, New York, future	1.66	1.66	1.66	1.31
Tank plates, New York, prompt	1.91	1.91	1.91	1.31
Beams, Pittsburgh, future.....	1.50	1.50	1.50	1.15
Beams, Pittsburgh, prompt.....	1.75	1.75	1.75	1.15
Beams, New York, future.....	1.66	1.66	1.66	1.31
Beams, New York, prompt.....	1.91	1.91	1.91	1.31
Angles, Pittsburgh, future.....	1.50	1.50	1.50	1.15
Angles, Pittsburgh, prompt.....	1.75	1.75	1.75	1.15
Angles, New York, future.....	1.66	1.66	1.66	1.31
Angles, New York, prompt.....	1.91	1.91	1.91	1.31
Skelp, grooved steel, Pittsburgh	1.45	1.45	1.45	1.12½
Skelp, sheared steel, Pittsburgh	1.50	1.50	1.50	1.20
Steel hoops, Pittsburgh.....	1.60	1.60	1.50	1.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire.	Jan. 29, 1913.	Jan. 22, 1913.	Dec. 24, 1912.	Jan. 24, 1912.
	Cents.	Cents.	Cents.	Cents.
Round to Large Buyers:	2.35	2.35	2.25	1.90
Sheet, No. 28, Pittsburgh	1.75	1.75	1.75	1.60
Wire, No. 28, Pittsburgh	1.80	1.75	1.75	1.75
Sheet, f.o.b. Eastern mills	1.70	1.70	1.70	1.55
Sheet, Pittsburgh	1.55	1.55	1.55	1.40
Fence wire, ann'l'd. 0 to 9, Pgh.	2.15	2.15	2.15	1.90
Barbed wire, galv., Pittsburgh				

Coke, Connellsville, Per Net Ton, at Oven:				
Pure coke, prompt shipment	\$3.50	\$3.75	\$4.00	\$1.75
Pure coke, future delivery	3.15	3.25	3.25	1.70
Pure coke, prompt shipment	4.25	4.25	4.50	2.00
Pure coke, future delivery	3.60	3.60	4.00	2.10

Metals.				
Per Pound to Large Buyers:				
	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	16.50	16.37½	17.62½	14.50
Electrolytic copper, New York	16.30	16.12½	17.50	14.25
Spelter, St. Louis	6.75	6.95	7.15	6.40
Spelter, New York	6.90	7.10	7.30	6.55
Lead, St. Louis	4.20	4.20	4.12½	4.37½
Lead, New York	4.35	4.35	4.27½	4.45
Tin, New York	50.40	50.50	50.15	42.87½
Antimony, Hallett, New York	9.25	9.25	9.50	7.55
Tin plate, 100-lb. box, Pittsburgh	\$3.60	\$3.60	\$3.60	\$3.40

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22½c.; Kansas City, 42½c.; Omaha, 42½c.; St. Paul, 32c.; Denver, 84½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.50c. to 1.75c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft., down to the weight of 3-16 in., take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in.	.10
Gauges under 3-16 in. to and including No. 2.	.15
Gauges under No. 8 to and including No. 9.	.25
Gauges under No. 9 to and including No. 10.	.30
Gauges under No. 10 to and including No. 12.	.40
Sketches (including straight taper plates) 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over.	.20
Boiler and flange steel.	.10
"A. B. M. A." and ordinary firebox steel.	.20
Still bottom steel	.30
Marine steel	.40
Locomotive fire box steel	.50
Widths over 100 in. up to 110 in., inclusive.	.05
Widths over 110 in. up to 115 in., inclusive.	.10
Widths over 115 in. up to 120 in., inclusive.	.15
Widths over 120 in. up to 125 in., inclusive.	.25
Widths over 125 in. up to 130 in., inclusive.	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inc.	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inc.	.50
Cutting to lengths or diameters under 1 ft.	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, 3 in. and over, 1.50c. to 1.75c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in. on one or both legs.	.10
Angles, 3 in. on one or both legs, less than ¼ in. thick.	.70
Tees, structural sizes (except elevator, hand rail, car track and conductor rail)	.05
Angles, channels and tees, under 3 in. wide as per steel bar card, Sept. 1, 1909.	.20 to .80
Deck beams and bulb angles.	.30
Hand rail tees	.75
Cutting to length, under 3 ft., to 2 ft. inclusive.	.25
Cutting to length, under 2 ft. to 1 ft. inclusive.	.50
Cutting to length, under 1 ft.	1.55
No charge for cutting to lengths 3 ft. and over.	

Wire Rods and Wire.—Bessemer, open hearth and chain rods, \$30. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, \$1.55; galvanized, \$1.95. Galvanized barb wire, to jobbers, \$2.15; painted, \$1.75. Wire nails to jobbers, \$1.75.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

		Plain Wire, per 100 lb.							
Nos.		0 to 9	10	11	12 & 12½	13	14	15	16
Annealed		\$1.70	\$1.75	\$1.80	\$1.85	\$1.95	\$2.05	\$2.15	\$2.25
Galvanized		2.10	2.15	2.20	2.25	2.35	2.45	2.85	2.95

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe (full weight) in effect from January 1, 1913; iron pipe (full weight), from October 21, 1912:

Butt Weld.					
Steel.			Iron.		
Inches.	Black.	Galv.	Inches.	Black.	Galv.
½, ¾ and 1.	73	52½	¾ and 1.	67	48
1½ to 3.	77	66½	1½	66	47
	80	71½	2	70	57
			¾ to 2½	73	62
Lap Weld.					
2	77	68½	1½	57	46
2½ to 6	79	70½	1½	68	57
7 to 12	76	65½	2	69	59
13 to 15	53		2½ to 4	71	62
			4½ to 6	71	62
			7 to 12	69	56

Plugged and Reamed.					
1 to 3, butt.	78	69½	1 to 1½, butt.	71	60
2, lap	75	66½	2, butt	72	61
2½ to 4, lap.	77	68½	1½, lap	55	44
			1½, lap	66	55
			2, lap	67	57
			2½ to 4, lap.	69	60

Butt Weld, extra strong, plain ends.					
¾, 1 and 1½	68	57½	¾	64	53
1½	73	66½	1½	68	61
¾ to 1½	77	70½	¾ to 1½	72	63
2 to 3	78	71½	2 and 2½	73	64

Lap Weld, extra strong, plain ends.					
2	74	65½	1½	66	60
2½ to 4	76	67½	2	67	59
4½ to 6	75	66½	2½ to 4	71	62
7 to 8	68	57½	4½ to 6	70	61
9 to 12	63	52½	7 and 8	64	54
			9 to 12	59	48

Butt Weld, double extra strong, plain ends.					
¾	63	56½	¾	58	50
¾ to 1½	66	59½	¾ to 1½	61	53
2 to 2½	68	61½	2 to 2½	63	55

Lap Weld, double extra strong, plain ends.					
2	64	57½	2	56	50
2½ to 4	66	59½	2½ to 4	61	55
4½ to 6	65	58½	4½ to 6	60	54
7 to 8	58	47½	7 to 8	53	43

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts on lap welded steel and standard charcoal iron boiler tubes to jobbers in carloads, in effect from January 1, 1913, are as follows:

Lap Welded Steel.		Standard Charcoal Iron.	
1½ and 2 in.	61	1½ in.	44
2½ in.	58	1½ and 2 in.	48
2½ and 3½ in.	64	2½ in.	44
3 and 3½ in.	69	2½ and 3½ in.	53
3½ to 4½ in.	71	3 and 3½ in.	55
5 and 6 in.	64	3½ to 4½ in.	58
7 to 13 in.	61	Locomotive and steamship special grades bring higher prices.	

2½ in. and smaller, over 18 ft., 10 per cent. net extra.

2½ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets.		Cents per lb.	
Nos. 3 to 8		1.70	
Nos. 9 and 10		1.75	
Nos. 11 and 12		1.80	
Nos. 13 and 14		1.85	
Nos. 15 and 16		1.90	
Box Annealed Sheets, Cold Rolled.		Cents per lb.	
Nos. 10 and 11		2.00	
No. 12		2.00	
Nos. 13 and 14		2.05	
Nos. 15 and 16		2.10	
Nos. 17 to 21		2.15	
Nos. 22 and 24		2.20	
Nos. 25 and 26		2.25	
No. 27		2.30	
No. 28		2.35	
No. 29		2.40	
No. 30		2.50	

Galvanized Sheets of Black Sheet Gauge.

	Cents per lb.
Nos. 10 and 11	2.50
No. 12	2.60
Nos. 13 and 14	2.60
Nos. 15 and 16	2.75
Nos. 17 to 21	2.90
Nos. 22 and 24	3.05
Nos. 25 and 26	3.20
No. 27	3.35
No. 28	3.50
No. 29	3.65
No. 30	3.80

Pittsburgh

PITTSBURGH, PA., January 28, 1913.

General conditions in the local iron trade are quiet, but the market continues strong except as to scrap and coke. The most encouraging feature of the week is the inquiry of the Pennsylvania Railroad system for 12,300 cars. It is said the Pennsylvania Lines West are also in the market for 100 locomotives. While the pig-iron market is fairly strong, any further serious decline in prices of coke may have a sympathetic effect. High prices are being paid for both billets and sheet bars for prompt shipment and for delivery over first half. The new demand for finished iron and steel is smaller, but the mills report that specifications in some cases are still in excess of shipment. C. M. Schwab, president of the Bethlehem Steel Company, who was one of the speakers at the annual dinner of the Engineers' Society of Western Pennsylvania, made the prediction that in 10 years or less this country would be consuming upward of 40,000,000 tons of steel per year. It is certain that the present consumptive demand is ahead of the output, as in many cases finishing mills are running below capacity because of shortage in supply of steel.

Pig Iron.—The market is quiet but prices are strong. Should contract furnace coke go down to \$2.75 or \$3 a ton it would probably result in the starting up of four or five merchant blast furnaces in the Pittsburgh and Valley districts that could then run and make a profit. There is practically no new inquiry for Bessemer or basic. The furnaces that sell basic in the open market are quoting \$16.50 or higher, but dealers who have accumulated some basic iron would shade this price 10c. to 15c. per ton on lots of 1000 to 3000 tons or more. This iron seems to be sufficient to meet the present demand. There have been reports the past week of sales of basic as high as \$16.50, Valley furnace, but they are not verified. A moderate inquiry for foundry and gray forge irons is observed. A strong feature of the market is that consumers are taking in iron on their contracts very promptly. We quote standard Bessemer iron for first half delivery at \$17.25 to \$17.50; basic, \$16.35 in small lots and \$16.50 in large lots; malleable Bessemer, \$17 to \$17.25; No. 2 foundry, \$17.50 to \$17.75; gray forge, \$16.25 to \$16.50, all at Valley furnace, the freight rate for delivery in the Pittsburgh district being 90c. a ton.

Billets and Sheet Bars.—A local dealer reports a sale of a round tonnage of open-hearth sheet bars for delivery up to July at \$29.75, Pittsburgh, and also reports a sale of a small lot of open-hearth billets for spot shipment at above \$30, Pittsburgh. Most of the steel that is being sold in the open market is by dealers and prices on these sales are governed largely by the necessities of the buyer. For reasonably prompt delivery we quote the steel market nominally as follows: Bessemer billets, \$28.50 to \$29; Bessemer sheet bars, \$29 to \$29.50; open hearth billets, \$29 to \$29.50, and open-hearth sheet bars, \$29.50 to \$30, f.o.b. mill, Pittsburgh or Youngstown. Forging billets are \$36 to \$37 and axle billets \$34 to \$35, Pittsburgh.

Ferroalloys.—We note a sale of 100 tons of 80 per cent. English ferromanganese for first quarter and 150 tons for second quarter, both at \$65, Baltimore. This price is being generally quoted for delivery in first half and second half. On carload lots for spot shipment, sellers quote \$67 to \$70. We note sales of two carloads, or about 60 tons, of 50 per cent. ferrosilicon at \$75, Pittsburgh. The market on this material is very strong. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at \$75; over 100 tons to 600 tons, \$74; over 600 tons, \$73, Pittsburgh. We quote 10 per cent. at \$24; 11 per cent., \$25; 12 per cent., \$26, f.o.b. cars at furnace, Jackson, Ohio, or Ashland, Ky. We quote ferrotitanium at 8c. per lb. in carloads; 10c. in 2000-lb. lots and over and 12½c. in lots up to 2000 lb.

Steel Rails.—No new orders for standard sections have been placed, but railroads are specifying freely against their contracts for rails for delivery in first half. The Carnegie Steel Company has at present more or-

ders on its books for standard sections than at any time for three or four years. The prosperous conditions existing in the coal trade are reflected in light rails, the new demand for which is active, the Carnegie Company having received new orders and specifications in the past week for over 5000 tons. We quote splice bars at 1.50c. per lb., and standard section rails at 1.25c. per lb. Light rails are quoted as follows: 25, 30, 35, 40 and 45-lb. sections, 1.25c.; 16 and 20-lb., 1.30c.; 12 and 14-lb., 1.35c., and 8 and 10-lb., 1.40c., all in carload lots, f.o.b. Pittsburgh.

Wire Rods.—The inquiry for 1000 tons of Bessemer and open-hearth rods for first quarter delivery referred to in this report last week has not resulted in an order, the local mills rolling rods not being able to make the deliveries wanted. The market is firm. We quote Bessemer, open-hearth and chain rods at \$30, Pittsburgh.

Muck Bar.—With no transactions, we quote best grades made from all pig iron at nominally \$31, Pittsburgh.

Skelp.—The new demand is fairly active, and the mills rolling skelp are pretty well sold up for three or four months. Prices are firm. We quote grooved skelp at 1.45c. to 1.50c.; sheared steel skelp, 1.50c. to 1.55c.; grooved iron skelp, 1.75c. to 1.80c.; sheared iron skelp, 1.85c. to 1.90c., delivered at buyers' mills in the Pittsburgh district.

Plates.—Heavy inquiries for steel cars are out. The Pennsylvania Railroad is in the market for 12,300 freight cars of various types, of which 10,000 are additions to equipment and 2300 represent replacements. It is also said that the Pennsylvania Lines West are in the market for 100 locomotives, and not 1000 as stated in the daily press. The Baltimore & Ohio, it is learned from an official source, will be in the market in a few days for 6000 or more cars of various types. The Norfolk & Western has bought 1000 hopper and 250 flat cars, and the Chesapeake & Ohio has bought 1000 hoppers and 300 flat cars. The Harriman order for 12,600 cars is ready to place, but the distribution has not yet been made. It is stated that inquiries in the market, together with others expected in a short time, represent 60,000 to 75,000 cars, which will require close to 900,000 tons of plates and shapes. The outlook for the car building industry this year is regarded as very bright. All the larger plate mills are sold up to July or longer. We quote ¼-in. and heavier tank plates at 1.45c. to 1.50c., Pittsburgh, for delivery at convenience of the mill, which would be not before second quarter and possibly third quarter, while for delivery in four to six weeks from 1.55c. to 1.60c. is quoted, and for shipment in two weeks, 1.75c. to 1.80c. can be had.

Structural Material.—The American Bridge Company has taken 300 tons for a new building for the Eastman Kodak Company, Rochester, N. Y., and the Pennsylvania Rubber Company, Jeannette, Pa., is in the market for 1000 tons for a new building. The Westinghouse Air Brake Company will place in a few days about 500 tons for its new foundry at Wilmerding, Pa. We quote beams and channels up to 15-in. at 1.45c. to 1.50c. for delivery at convenience of the mill, which means third or fourth quarter of this year, while small lots from warehouse or other sources for delivery in three to four weeks are bringing all the way from 1.75c. to 2c. or higher.

Car Wheels.—The demand for cast-iron and rolled steel car wheels is very heavy. With the new orders for steel cars just placed and with others pending, the outlook for the car wheel industry is very good, indications being that the foundries will have all the work they can handle. We quote 33-in. rolled steel wheels for freight service at \$15 to \$15.50 and 36-in. for passenger cars at \$19 to \$19.50 per wheel, f.o.b. Pittsburgh.

Iron and Steel Bars.—A feature of the market is the continued heavy demand for iron bars from railroads and other consumers. The bar iron mills are having the most prosperous trade they have had in some years. The difficulty in getting deliveries of steel bars has caused some former consumers of these to go back to the use of iron bars. There is also a fairly active demand for steel bars. The steel bar mills are back in deliveries eight to ten weeks or longer, and have their output sold up for months ahead. The Carnegie Steel Company has sold practically its entire output of bars through third quarter. We quote merchant steel bars at 1.40c. to 1.45c. for delivery at convenience of the mill, which would not be before third quarter, while for fairly prompt shipments 1.60c. to 1.75c. is readily paid, and in some cases sales for prompt delivery have been made at 1.85c. and higher.

We quote iron bars at 1.70c. to 1.75c. for reasonably prompt delivery. Mills continue to charge \$1 extra per ton for twisting 1/4-in. and larger steel bars, and \$2 extra for 1/2 to 3/8-in.

Sheets.—The new demand for sheets is fairly active, mostly for delivery in third quarter. None of the mills has opened its books for sales to jobbers for third quarter, but some business is being taken from manufacturing customers for this delivery. The market is firm on the basis of 1.75c. for No. 10 blue annealed; 2.35c. for No. 28 Bessemer black sheets; 3.50c. for No. 28 galvanized and 2.30c. for No. 28 tin mill black plate. These prices are f.o.b. Pittsburgh, in carload and larger lots, jobbers charging the usual advances for small lots from store.

Tin Plate.—Trade is dull, due to the off season, and specifications against contracts are not coming in as freely as anticipated. A good part of the tin plate that will be made this year is under contract, and the mills look for active specifications to start in February or early in March. Reports of a probable advance in prices are not believed to be well founded. It is stated that the leading interest is opposed to any change in the market at this time. We quote 100-lb. cokes at \$3.70 and 100-lb. ternes at \$3.45 f.o.b. Pittsburgh. Black plate is firm at \$2.30 for No. 28 gauge.

Spelter.—The market is dull and prices are weak. We quote prime grades of Western at 7.05c. East St. Louis, equal to 7.17 1/2c. Pittsburgh, and on a firm offer this might be shaded.

Railroad Spikes.—The new demand is quiet but the outlook for the spike trade this year is regarded as very bright, as it is certain that the railroads will lay a good deal more new trackage this year than last. We quote railroad spikes in base sizes, 5 1/2 x 9/16 in., at \$1.90, and small railroad and boat spikes at \$1.90 and \$2 per 100 lb., f.o.b. Pittsburgh, for forward delivery. Small spikes have sold as high as \$2.25 for prompt shipment.

Hoops and Bands.—A heavy inquiry is in this market for bands for delivery in Oklahoma, but none of the local mills is quoting against it as they cannot make the deliveries wanted. We quote steel bands at 1.45c. to 1.50c., with extras as per the steel bar card, and steel hoops at 1.60c. to 1.65c. f.o.b. Pittsburgh, these prices being on orders for shipment at convenience of the mills.

Shafting.—Makers report the new demand as only moderate, most consumers having covered ahead for some time. Consumers are specifying freely against contracts and shipments are heavy. We quote cold rolled shafting at 58 per cent. off in carloads and larger lots and 52 per cent. off in small lots delivered in base territory.

Merchant Steel.—Mills report specifications against contracts coming in very well. The new demand is rather quiet, as most consumers are covered to July or longer. We quote: Iron finished tire, 1 1/2 x 3/8 in. and larger, 1.40c. to 1.55c., base; under 1 1/2 x 3/8 in., 1.55c. to 1.65c.; planished tire, 1.60c. to 1.70c.; channel tire, 1/4, 3/8 and 1 in., 1.90c. to 2c.; 1 1/8 in. and larger, 1.80c. to 1.90c.; toe calk, 2c. to 2.10c., base; flat sleigh shoe, 1.50c. to 1.65c.; concave and convex, 1.80c. to 1.90c.; cutter shoe, tapered or bent, 2.30c. to 2.40c.; spring steel, 2c. to 2.10c.; machinery steel, smooth finish, 1.80c. to 1.85c. We quote cold rolled strip steel as follows: Base rates for 1 in. and 1 1/2 in. and wider, under 0.20 carbon, and No. 10 and heavier, hard temper, 3.30c.; soft, 3.55c.; coils, hard, 3.20c.; soft, 3.45c.; freight allowed. The usual differentials apply for lighter gauges and sizes.

Merchant Pipe.—The new demand for merchant pipe is heavier than usual at this time of the year, which is always the dull season in the pipe trade. Actual orders taken by the mills this month are in excess of December. An inquiry is out for 100 miles of 12-in. and 75 miles of 16-in. line pipe for a natural gas company for delivery at Edmonton, Alberta, Canada. Other large gas and oil line projects are being talked of, and with the active conditions in the oil trade and the higher prices ruling, the laying of oil lines this year promises to be heavy. All the mills are back in shipments six to eight weeks or longer. It is stated that discounts on both iron and steel pipe are being firmly held.

Wire Products.—Labor troubles have broken out at the Braddock and Rankin works of the American Steel & Wire Company, and both these plants are practically idle. Some of the men made a demand for an increase in wages which was refused. The new demand for wire nails is reported active, but plain wire is dull and neglected. Jobbers and consumers are specifying freely against contracts for wire nails and the outlook for spring trade is regarded as bright. It is

stated that regular prices are being absolutely maintained. We quote wire nails at \$1.75 per keg; cut nails, \$1.70 per keg; galvanized barb wire, \$2.15 per 100 lb.; painted, \$1.75; annealed fence wire, \$1.55, and galvanized fence wire, \$1.95, f.o.b. Pittsburgh, usual terms, freight added to point of shipment. Jobbers charge the usual advances for small lots from store.

Bolts and Rivets.—The new demand is reasonably good, but most consumers have pretty well covered their requirements through second quarter. All the makers of bolts and rivets are back in deliveries from six to eight weeks or longer. Prices are firm, and it is said that premiums are still being paid for prompt delivery. We quote button head structural rivets at \$2.20 and cone head boiler rivets at \$2.30 per 100 lb. The discounts on bolts are as follows, in lots of 300 lb. or over, delivered within a 20c. freight radius of maker's works:

Coach and lag screws	80 and 10% off
Small carriage bolts, cut threads.....	75 and 5% off
Small carriage bolts, rolled threads.....	75 and 10% off
Large carriage bolts	70% off
Small machine bolts, rolled threads.....	75, 10 and 5% off
Small machine bolts, cut threads.....	75 and 10% off
Large machine bolts	70 and 7% off
Machine bolts with C.P.C. and T nuts, small.....	75 and 5% off
Machine bolts with C.P.C. and T nuts, large.....	70% off
Square hot pressed nuts, blanked and tapped.....	\$5.70 off list
Hexagon nuts	\$6.30 off list
C.P.C. and R. square nuts, tapped and blank.....	\$5.70 off list
Hexagon nuts 3/4 and larger	\$6.60 off list
Hexagon nuts smaller than 3/4.....	\$7.20 off list
C.P. plain square nuts.....	\$5.20 off list
C.P. plain hexagon nuts.....	\$5.50 off list
Semi-finished hexagon nuts 3/4 and larger.....	85% off
Semi-finished hex. nuts smaller than 3/4.....	85 and 10% off
Rivets, 7/16 x 6 1/2, smaller and shorter.....	75, 10 and 10% off
Rivets, metallic tinned, bulk.....	3 1/2c. per lb. net extra
Rivets, tin plated, bulk.....	1 1/2c. per lb. net extra
Rivets, metallic tinned, packages.....	70, 10 and 10% off

Boiler Tubes.—A local maker is reported to have taken a contract for the tubes for the 65 locomotives recently placed by the Pennsylvania Lines West. The new demand is good and boiler shops and other consumers are specifying actively against contracts.

Coke.—Due to the very heavy output at the ovens and temporary suspensions of shipments by three of the large steel companies, putting a good deal of coke on the market to find buyers, prices of furnace coke have materially declined in the past few days. In the latter part of last week furnace coke for spot shipment sold at \$3.60 to \$3.75, but this week sales have been made of 3000 to 3500 tons at \$3.50 and there is evidence that \$3.40 or lower could be done. Furnace coke on contracts is also lower, and, while \$3.15 is now being named for delivery in first half, it is probable that a firm offer of \$3 would be accepted. The new demand is dull, and owing to favorable weather the railroads have been delivering coke very promptly with the result that consumers in some cases are getting it faster than they need it. One large consumer in this district reports that on one day last week it had 526 cars of coke in transit and in its yards. The market on foundry coke is also easier. We now quote standard makes of blast furnace coke for prompt delivery at \$3.40 to \$3.50; on contracts for first half, \$3.15; for last half, about \$3 per net ton at oven. We quote standard makes of foundry coke for prompt delivery at \$4 to \$4.25, and on contracts about \$3.50 for first half of this year, per net ton at oven. The output of coke in the Connellsville region last week is given by the Connellsville Courier at 400,000 tons, an increase over the previous week of 5000 tons.

Iron and Steel Scrap.—The report that a large consumer located east of Pittsburgh has bought 17,000 to 20,000 tons of heavy steel scrap has been officially denied. The report is also denied of an embargo on scrap at the plant of the West Penn Steel Company, Brackenridge, Pa., but an embargo exists on scrap routed for the Pittsburgh Steel Company, Monessen, Pa. The scrap market seems to be somewhat demoralized by heavy offerings. Leading consumers bought heavily last fall in anticipation of delayed winter shipments by the railroads but the weather has been so mild that shipments have gone forward promptly, with the result that nearly all are overstocked. Heavy steel scrap is offered freely at \$14.75 and in one or two cases at \$14.50. The market on borings is dull and lower, while bundled sheet scrap has also gone off. The local steel company that for some time dominated the market on heavy steel scrap by reason of regular purchases now declines to take in any more, and this has further adversely affected the market. Sales are reported of about 8000 tons of heavy steel scrap at a delivered price of \$15 to a point outside the Pittsburgh district, equal to about \$14.75. Pittsburgh district de-

livery. We also note a sale of 500 tons of selected heavy steel scrap made last week at \$15, but this price is above the market to-day. Dealers quote, per gross ton, as follows:

Heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen and Pittsburgh delivery	\$14.50 to \$14.75
No. 1 foundry cast	15.00 to 15.25
No. 2 foundry cast	14.00 to 14.25
Bundled sheet scrap, L.o.b. consumers' mills, Pittsburgh district	12.50 to 12.75
Revolving rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	16.25 to 16.50
No. 1 railroad malleable stock	14.25 to 14.50
Grate bars	10.75 to 11.00
Low phosphorus melting stock	18.00 to 18.25
Iron car axles	24.25 to 24.75
Steel car axles	17.75 to 18.00
Locomotive axles, steel	21.75 to 22.00
Locomotive axles, iron	27.75 to 28.00
No. 1 busheling scrap	14.25 to 14.50
No. 2 busheling scrap	10.25 to 10.50
Old car wheels	15.75 to 16.00
*Cast-iron borings	10.00 to 10.25
*Machine shop turnings	9.75 to 10.00
†Steel bar crop ends	16.50 to 16.75
Old iron rails	16.25 to 16.50
No. 1 railroad wrought scrap	16.00 to 16.25
Heavy steel axle turnings	12.75 to 13.00
Stove plate	10.75 to 11.00

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

†Shipping point.

Chicago

CHICAGO, ILL., January 28, 1913.

Inquiry for Northern iron for both second quarter and the remainder of the year is more active. For the latter delivery, inquiry is thought to be largely for information on which to base contracts for castings running through the year. A few important sales have been made but the greater number of orders are small. Lower prices prevail for Northern iron but in the South the situation is somewhat improved from the furnace standpoint, although spot shipment iron has required more marked concessions to move. In the mill situation, deliveries are unimproved, and specifications received here in January promise to exceed the total booked in December. Anticipation of requirements to an unusual degree is in part responsible for current heavy specifications, and the open weather has augmented railroad activity ordinarily at a minimum during the winter. Bar iron mills report more unfilled tonnage on their books than at any previous time. New business in sheets continues to appear in surprising quantity, and jobbers are putting pressure on local mills to increase their allotment of material. Although a number of the mills have nominally avoided very extensive booking of second half business as such, it is increasingly apparent that most of the mills are heavily oversold for first half and will carry over a large tonnage into the third quarter. The prolonged depression of scrap values is even more pronounced, and material is being offered at lower prices. The approach of conditions that will readjust old material prices to the prevailing prices of new material is not yet apparent.

Rails and Track Supplies.—The unusual extent to which the railroads have anticipated spring requirements in their specifications has been responsible in large measure for an aggregate received by the mills in January which will in all probability exceed the tonnage of specifications booked in December. Track fastenings in particular are being ordered heavily. Consideration is being given in several instances to Bessemer rails as a solution of the delivery problem where small lots are to be purchased. We quote standard railroad spikes at 1.95c. to 2.05c., base; track bolts with square nuts, 2.30c. to 2.40c., base, all in carload lots, Chicago; tie plates, \$32 to \$34.50 net ton; standard section Bessemer rails, Chicago, 1.25c., base; open hearth, 1.34c.; light rails, 25 to 45 lb., 1.25c.; 16 to 20 lb., 1.30c.; 12 lb., 1.35c.; 8 lb., 1.40c.; angle bars, 1.50c., Chicago.

Pig Iron.—Melters are displaying some hesitancy in buying. This is probably due, in those instances where iron is yet to be bought, to the evidences of weakness which have appeared in both Southern and Northern iron. The Southern situation is somewhat improved as the result of heavy selling by some of the interests making concessions, but at the same time a number of cars of spot iron from the South brought only \$13.75, Birmingham. Some of the leading producers who are well sold up are still asking \$14.50 for No. 2. On recent sales of Northern iron in Wisconsin territory prices as low as \$17.50 at Chicago furnace have been done. One interest buying for last half delivery was able to approximate that price for a con-

siderable tonnage. Inquiry for last half iron from malleable foundries is appearing rather freely, although a considerable portion of this inquiry is interpreted as a preface to the making of annual contracts for castings. Purchases of lots of 1000 and 1500 tons of local iron for second quarter are also noted. The following quotations are for iron delivered at consumers' yards except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a local switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 1, 2, 3, 4	\$18.00 to \$18.75
Northern coke foundry, No. 1	18.00 to 18.50
Northern coke foundry, No. 2	17.50 to 18.00
Northern coke foundry, No. 3	17.00 to 17.50
Southern coke, No. 1 foundry and No. 1 soft	18.35 to 18.85
Southern coke, No. 2 foundry and No. 2 soft	17.85 to 18.35
Southern coke, No. 3	17.35 to 17.85
Southern coke, No. 4	16.85 to 17.35
Southern gray forge	16.85 to 17.35
Southern mottled	16.35
Malleable Bessemer	17.50 to 18.00
Standard Bessemer	19.40 to 19.90
Basic	17.50 to 18.00
Jackson Co. and Kentucky silvery, 6 per cent.	20.40
Jackson Co. and Kentucky silvery, 8 per cent.	21.40
Jackson Co. and Kentucky silvery, 10 per cent.	22.40

Structural Material.—The contracts placed the past week for fabricated material carried an aggregate of approximately 4000 tons. The largest tonnage was involved in the Metropolitan Building of Los Angeles, taken by the American Bridge Company, which will also supply 300 tons for the First National Bank Building, Great Falls, Mont.; 306 tons for signal bridges for the Chicago & Northwestern Railroad, and 350 tons for an Atchison, Topeka & Santa Fe station at Galveston, Texas. The Calumet & Hecla Mining Co. placed 392 tons for an electrolytic plant with the Worden-Allen Company. The Hansell-Elcock Company will furnish 153 tons for the State Hospital at Dunning, Ill., and 510 tons for the Chicago Bearing Metal Company's brass foundry. Four deck plate girders for the Salt Lake & Ogden Railroad, 273 tons, were awarded to J. J. Burke & Sons. We quote for Chicago delivery, plain shapes, 1.63c.

Current demand for structural from warehouse shows no let up and we quote for shapes from store, base sizes, 2.05c.

Plates.—Orders for additional railroad equipment continue to appear, the Rock Island purchasing 500 coal cars, 1000 box cars and 55 locomotives. It is understood that approximately the same amount of equipment remains to be purchased by this road. The Chicago, Indianapolis & Louisville still has an inquiry in the market for 200 cars in addition to a large order placed with the Haskell & Barker Car Company. Although ostensibly there has been little placing of second half plate business with the mills, it is increasingly apparent that orders booked nominally for delivery in the first half will be carried over into the third quarter. We quote for Chicago delivery from mill, 1.63c.

Users of plates requiring prompter delivery than is obtainable from mill without payment of premium are finding it advantageous to secure their mill shipments through jobbers. We quote for plates out of store 2.05c.

Sheets.—New business in sheets materializing from manufacturers' requisitions continues to appear in greater volume than can be accommodated by local mills. It has been found necessary to curtail in some instances the quantity of material ordered and jobbers in particular are importuning the mills to increase their apportionment. We quote for Chicago delivery in carloads from mill: No. 28 black sheets, 2.53c.; No. 28 galvanized, 3.68c.; No. 10 blue annealed, 1.88c.

Out of store, we quote as follows: No. 10 blue annealed, 2.35c.; No. 28 black, 2.90c.; No. 28 galvanized, 4.15c.

Bars.—Local bar iron mills report a larger unfilled tonnage on their books than at any previous time. Current inquiries total from 4000 to 5000 tons. The steel bar situation is maintained, but, for the spring requirements of hard steel and reinforcing bars, local mills have made some reservation, as a result of which it will be possible to place business in the second quarter with a prospect of prompt delivery. We quote for mill shipment as follows: Bar iron, 1.57½c. to 1.60c.; soft steel bars, 1.58c. to 1.65c.; hard steel bars, 1.60c. to 1.70c.; shafting in carloads, 58 per cent. off; less than carloads, 53 per cent. off.

For delivery from store, we quote soft steel bars, 1.95c.; bar iron, 1.95c.; reinforcing bars, 1.95c. base with 5c. extra for twisting in sizes ¾ in. and over, and 7½c. extra for smaller sizes; shafting 51 per cent. off.

Rivets and Bolts.—Some of the bolt and nut manufacturers report their situation with regard to deliveries as growing worse rather than otherwise. Bolt prices are firmer than the trade has experienced in a long

time. Our quotation for rivets continues to be largely nominal, as concessions from this price are not difficult to obtain. We quote from mill as follows: Carriage bolts, 2 to 3/4 x 6 in., rolled thread, 75-10; cut thread, 75-5; larger sizes, 70-2 1/2; machine bolts up to 3/4 x 4 in., rolled thread, 75-10-5; cut thread, 75-10; large sizes, 70-7 1/2; coach screws, 80-10; hot pressed nuts, square head, 70 off per cwt.; hexagon, \$6.30 off per cwt. Structural rivets, 3/4 to 1 1/4 in., 2.38c., base, Chicago, in carload lots; boiler rivets, 0.10c. additional.

Out of store we quote for structural rivets, 2.70c., and for boiler rivets, 2.90c. Machine bolts up to 3/4 x 4 in., 70-7 1/2; larger sizes, 70-5; carriage bolts up to 3/4 x 6 in., 70-5; larger sizes, 65 off. Hot pressed nuts, square head, \$5.30, and hexagon, \$5.90 off per cwt.

Cast Iron Pipe.—The only municipal lettings scheduled for the near future are 5000 tons at San Diego, Cal., to be awarded February 3, and 1000 tons at Yankton, S. D., which will be placed through a contractor. The city of Chicago is expected to be in the market for about 5000 tons of pipe within the next few weeks. We quote as follows, per net ton, Chicago: Water pipe, 4 in. \$31; 6 to 12 in., \$29; 16 in. and up, \$28, with \$1 extra for gas pipe.

Wire Products.—Wire nails are moving to jobbers for the replenishment of their stocks with moderate activity. Increased business is also noted in barb wire as a result of the early spring demand from the South. Manufacturers of wire products are operating at a high rate. We quote as follows: Plain wire, No. 9 and coarser, base, \$1.73; wire nails, \$1.93; painted barb wire, \$1.93; galvanized, \$2.33; polished staples, \$1.93; galvanized, \$2.33, all Chicago.

Old Material.—The conditions which have stagnated the local scrap market for several weeks are still unrelieved. With no increase in the demand from consumers, old material is being offered at still lower prices. For No. 1 wrought \$12.75 delivered at consumer's yards can be done easily and a purchase was made direct from a railroad at an even lower figure. No appreciable inroads have been made as yet on the large supply available in this market, and a return to firmer conditions is correspondingly indefinite. The railroad offerings of scrap include 4000 tons from the Chicago, Rock Island & Pacific, of which the largest item is 800 tons of rails, and about 3000 tons from the Chicago, Burlington & Quincy. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton.	
Old iron rails	\$16.75 to \$17.25
Old steel rails, rerolling	16.00 to 16.50
Old steel rails, less than 3 ft.	14.00 to 14.50
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	16.75 to 17.25
Heavy melting steel scrap	12.50 to 13.00
Frogs, switches and guards, cut apart	12.50 to 13.00
Shoveling steel	12.25 to 12.75
Steel axle turnings	11.00 to 11.50

Per Net Ton.	
Iron angles and splice bars	\$16.00 to \$16.50
Iron arch bars and transoms	16.50 to 17.00
Steel angle bars	12.00 to 12.50
Iron car axles	21.50 to 22.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	12.50 to 12.75
No. 2 railroad wrought	12.00 to 12.50
Cut forge	12.00 to 12.50
Steel knuckles and couplers	12.75 to 13.25
Steel springs	13.25 to 13.75
Locomotive tires, smooth	13.75 to 14.25
Machine shop turnings	8.00 to 8.50
Cast and mixed borings	7.00 to 7.50
No. 1 busheling	10.75 to 11.25
No. 2 busheling	8.00 to 8.50
No. 1 boilers, cut to sheets and rings	9.25 to 9.75
Boiler punchings	12.50 to 13.00
No. 1 cast scrap	12.75 to 13.25
Stove plate and light cast scrap	10.50 to 11.00
Railroad malleable	13.25 to 13.75
Agricultural malleable	12.00 to 12.50
Pipes and flues	9.25 to 9.50

Philadelphia

PHILADELPHIA, PA., January 28, 1913.

Particular interest is manifested in the announcement of the Pennsylvania Railroad's intention to place orders for 12,300 freight cars, for which bids are now being asked. Optimistic expressions as to business are heard, and proposed enlargements of various departments of the Baldwin Locomotive Works are regarded as giving considerable encouragement, notwithstanding increasing quietness in a majority of iron and steel products. The movement in pig iron continues on narrow lines and sentimental weakness still prevails. In some classes of finished products inquiries as well as orders are still at a relatively high rate. Further tentative in-

quiries from shipbuilders for moderate lots of plates and shapes for the purpose of making estimates are noted. Sheets for prompt delivery have been in sharp demand. Both foundry and furnace coke are weaker, prompt supplies being more freely offered. The old material market shows further evidences of weakness in nearly all grades.

Iron Ore.—Delayed deliveries of domestic ores, owing in instances to labor difficulties, have caused consumers some anxiety as to continuous steady supplies and have resulted in some inquiries for early deliveries. A resale of 2500 tons of Wabana at 7 1/2c. a unit is reported. New business in foreign ores has been quiet. Importations during the week were confined to a cargo of 6500 tons of Cuban ore.

Pig Iron.—Consumers continue to pursue a waiting policy. A large majority, being covered for the greater portion of their first-quarter needs, show little disposition to enter the market for any material quantity. While producers, as far as can be learned, have not made offerings of standard brands at concessions, and while costs of production are increasing rather than decreasing, it will require more active inquiry to establish a market level. Small sales make up the bulk of the business moving in foundry grades, with prices of standard brands of No. 2 X eastern Pennsylvania at \$18.50, delivered here. Less desirable brands are, however, available at \$18.25, while a few producers still adhere to quotations slightly above those at which current business is done. In Virginia several producers have expressed their willingness to accept business for second quarter at the price established by the leading producer, namely, \$15.50, furnace, for No. 2 X. For first quarter, \$16, furnace, is still quoted, although the supply available is limited, particularly as several merchant producers' furnaces in that district have been recently operating somewhat unsatisfactorily. Cast-iron pipe makers in this district, while not active buyers, have taken on small lots of iron; one sale of 500 tons of off-analysis, low-grade iron was sold at \$17.25, delivered on the Delaware River. Several small lots of Virginia low-grade iron have been sold to cast-iron pipemakers in that district. While no movement in Southern iron is reported it is interesting to note that one Tennessee furnace company which recently made sales at \$13.50, Birmingham basis, for No. 2 foundry, has advanced its price to \$14. Small lot sales of charcoal iron have been made, while negotiations for coke malleable are still pending. Rolling mill forge iron continues in fair demand, with negotiations for several moderate lots pending and inquiries for further large lots in sight. Very little movement in steel-making iron is noted. Basic is uncalled for, while moderate sales of standard-analysis, low-phosphorus pig have been made at \$24.50, delivered here. One large producer of Lebanon Valley low-phosphorus pig has sold moderate lots on the basis of \$21, at furnace. Makers report continued requests from customers for urgent deliveries on practically all grades of iron. With the dragging tendency of the market prices are quotably unchanged, the following range being named for prompt lots, but would also be taken as applying on second quarter contracts, delivery in buyers' yards in this vicinity:

Eastern Pennsylvania No. 2 X foundry	\$18.50
Eastern Pennsylvania No. 2 plain	18.25
Virginia No. 2 X foundry (first quarter)	\$18.80 to 19.00
Virginia No. 2 plain (first quarter)	18.55 to 18.75
Virginia No. 2 X foundry (second quarter)	18.30 to 18.50
Virginia No. 2 plain (second quarter)	18.05 to 18.25
Gray forge	17.50 to 17.75
Basic	18.00 to 18.25
Standard low phosphorus	24.50

Ferroalloys.—Little demand for either ferromanganese or ferrosilicon has developed. Carload lots of 80 per cent. ferromanganese have been sold at \$65, seaboard, for prompt shipment, while the same quotation is made for second quarter or last half deliveries. The demand for ferrosilicon, either 50 per cent. or furnace grades, is practically at a standstill and prices remain unchanged.

Billets.—Both rolling and forging steel has been less strongly in demand, although considerable unclosed business is still before the trade. Western consumers are still seeking billets here, but mills are very comfortably fixed for both first and second quarter and are not anxious for business, rather welcoming the lessening demand. Inquiries and orders for moderate lots continue to be received from Canadian consumers. Prices are exceedingly firm at \$32, delivered, for basic open hearth rolling billets, and \$36, mill, minimum for ordinary forging steel, with sharp premiums for prompt delivery when available.

Plates.—Eastern mills are entering a very fair volume of miscellaneous business, as well as taking good

contracts, ranging up to 1000-ton lots for second quarter delivery. With some makers, orders fully equal current production, and difficulties are experienced in making satisfactory deliveries. Specifications against orders are heavy, particularly for car and structural plates. Inquiry for some 1500 tons of boat plates, for estimating purposes, has been made by a ship builder. Quotations are firm, and while 1.65c., delivered, is named by some mills, subject to uncertain delivery, Eastern mills readily obtain 1.75c. for sheared and 1.80c. for universal plates, delivered here in the first half of the year.

Structural Material.—Mills and fabricators are figuring on considerable work. Several moderate building projects are being estimated on, as well as some small bridge work. Some 15,000 tons of shapes will be required for transmission towers in Panama. A good volume of business in boat shapes is in sight. Mills are operating at full capacity and some producers are not anxious for second quarter contracts. Prompt delivery on plain shapes is hard to obtain. Prices are firm, 1.75c. being named for plain shapes for early delivery, while for prompt shipment, when available, up to 2c., mill, has been paid.

Sheets.—A very satisfactory business is moving, although the general demand is lighter. Prompt sheets are scarce and command premiums ranging from \$3 to \$5 a ton. Eastern mills are receiving inquiries for urgent delivery, to cover delayed deliveries on contracts with Western makers. Mill operations in this district are at full capacity and prompt sheets less freely obtainable. Western No. 10 blue annealed sheets are quoted at 1.90c., delivered here, although Eastern mills, making smooth, loose-rolled sheets of the same grade, readily obtain 2.05c. for early deliveries.

Bars.—A moderate volume of business is moving in iron bars. With more mills in operation less stringency in the supply of bars for early delivery is noted, and current business is placed at 1.67½c., delivered here, although some makers hold at 1.70c., mill, minimum. Steel bars are in good demand, but for early delivery are scarce. Prompt steel bars are quoted at 1.85c., here, with contract bars at 1.55c. to 1.60c. Specifications continue heavy.

Coke.—Prices are decidedly weaker, due to better supplies and, in a measure, to a decrease in the number of active furnaces and curtailments in shipments ordered by others who have been receiving an over supply. No large contracts for furnace coke are noted, although available at \$3 to \$3.25 at oven. Prompt furnace coke is weaker and could be had at \$3.25. Foundry coke is sympathetically weaker and is available at \$4 to \$4.25, oven, although small sales have been made at \$4.50. The following range of prices, per net ton, is named for delivery in buyers' yards in this district:

Connellsville furnace coke	\$4.75 to \$5.50
Connellsville foundry coke	5.75 to 6.25
Mountain furnace coke	4.50 to 5.00
Mountain foundry coke	5.50 to 6.00

Old Material.—Dullness and weakness characterize the market. Supplies in dealers' hands are large, while consumers' yards are full of scrap, and buyers of even bargain lots are less numerous. Heavy melting steel has been taken at \$14, and it is reported that that price has been shaded. What little business has been going has usually been at slightly lower prices. Old car wheels are in demand at \$16.50, delivered, but are scarce. Rolling mill grades are exceedingly quiet. While prices are, to a large extent, nominal, the following range about represents sellers' ideas for deliveries in buyers' yards in this district, covering eastern Pennsylvania and nearby points, taking a freight rate varying from 35c. to \$1.35 per gross ton:

No. 1 heavy melting steel.....	\$14.00 to \$14.50
Old steel rails, rerolling (nominal).....	16.50 to 17.00
Low phosphorus heavy melting steel scrap..	18.25 to 18.75
Old steel axles (nominal).....	19.00 to 20.00
Old iron axles (nominal).....	27.00 to 28.00
Old iron rails.....	18.00 to 18.50
Old car wheels.....	16.25 to 16.75
No. 1 railroad wrought (nominal).....	15.75 to 16.25
Wrought-iron pipe.....	12.75 to 13.25
No. 1 forge fire.....	12.50 to 13.00
No. 2 light iron (nominal).....	8.00 to 8.50
Wrought turnings.....	10.75 to 11.25
Cast borings.....	10.50 to 11.00
Machinery cast.....	14.50 to 15.00
Grate bars, railroad.....	10.50 to 11.00
Stove plate.....	10.50 to 11.00
Railroad malleable (nominal).....	13.50 to 14.00

Charles K. Barnes & Co. will remove February 1 to 819-820 Philadelphia Stock Exchange Building, Walnut and Broad streets, Philadelphia.

Cleveland

CLEVELAND, OHIO, January 28, 1913.

Iron Ore.—The chartering of vessel tonnage for the ore trade is practically over and several of the largest shippers have contracted for more tonnage than a year ago. Less wild vessel tonnage will be available during the season than in previous years. The market is lifeless, no sales or inquiries being reported. Dock shipments are heavy for this season of the year. The complaint of a shortage of cars for ore shipments seems to have disappeared. We quote prices as follows: Old range Bessemer, \$4.40; Mesaba Bessemer, \$4.15; old range non-Bessemer, \$3.60, and Mesaba non-Bessemer, \$3.40.

Pig Iron.—The weakness in Southern iron has resulted in offerings of foundry grades in northern Ohio territory outside of Cleveland at lower prices than the ruling quotations on Northern iron. It has been a long time since Southern foundry iron could be purchased at a lower delivered price than Northern in this territory. Another unusual market condition is the offering of southern Ohio foundry iron to northern Ohio consumers at \$16.50, Ironton, or a price lower at receiving points than on Northern grades at regular quotations. To meet the southern Ohio prices at many northern Ohio points, Valley and Cleveland furnaces must shade their prices 50c. a ton to \$17 for No. 2. The weakness in Southern and southern Ohio iron has had some effect on Northern foundry grades, on which the regular price of \$17.50 for No. 2 is not being so firmly maintained. However, while there are some reports of slight concessions, the shading is by no means general and quotations are unchanged. There is not much activity in the market. Sellers report a moderate volume of buying in small lots for last half delivery, for which \$17.50, furnace, appears to be well maintained. None of the large consumers has as yet come into the market for last half iron. A few small sales of Southern iron are reported at \$13.50, Birmingham, for No. 2. For prompt shipment and for first half we quote, delivered Cleveland, as follows:

Bessemer	\$18.15 to \$18.40
Basic	17.40 to 17.75
Northern No. 2 foundry	17.75 to 18.00
Southern No. 2 foundry	17.85 to 18.35
Gray forge	17.15 to 17.40
Jackson County silvery, 8 per cent. silicon.	20.55 to 21.55

Coke.—The market is weaker on both grades and the demand is light. For prompt shipment standard Connellsville furnace coke is quoted at \$3.50 to \$3.60 per net ton at oven and about \$3.10 to \$3.25 for contract. We quote standard 72-hr. foundry coke at \$4.25 to \$4.50 for prompt shipment and \$4 for contract. Wise County coke is quoted at \$3.75 for the last half.

Finished Iron and Steel.—A fair volume of business is coming out in current orders. Not much tonnage is being tied up in contracts but sellers generally report that they could take on a great deal for future delivery if they wanted to do so. Some new contracts are reported at 1.40c. Pittsburgh for steel bars and 1.50c. for structural material for delivery at the convenience of the mills. Mills generally appear at present to be getting no further behind on deliveries but are not catching up. A round tonnage in forging billets was placed under contract in the week for second quarter and last half delivery at \$4 and \$5 extra over base prices. The Wheeling & Lake Erie Railroad, following its purchase of 4500 tons of steel rails noted last week, has placed orders for 1500 50-ton steel hopper cars, 1000 of these going to the Standard Steel Car Company and 500 to the American Car & Foundry Company. The Schoen Wheel Works of the Carnegie Steel Company will furnish 4000 steel car wheels in connection with these car orders. In addition to car orders this railroad has just placed with the Wellman-Seaver-Morgan Company, Cleveland, a contract for two 15-ton Hulett ore unloaders to be installed at Huron, Ohio. This railroad will also within a few days place orders for 20 locomotives. In structural lines no new inquiries have developed but considerable business is in prospect. Bids will be received January 31 for 1000 tons for the municipal lighting plant, Cleveland. Warehouse business continues very heavy. Some steel bar sales in lots up to 100 tons are being made at stock prices to consumers who have been unable to get deliveries from the mills. Local bar iron mills have advanced minimum prices to 1.65c. Cleveland. There is a good demand for iron bars and Cleveland mills are about two months behind on deliveries. There is a good demand for shafting and new prices are being maintained. The demand for sheets is quite active. Warehouse prices are unchanged

at 2.05c. for steel bars and 2.25c. for plates and structural material.

Old Material.—The market is inactive and prices are weak. Although nominal quotations are generally unchanged. The supply available is large and dealers' yards are well filled. Sellers are apparently making no effort to make sales. There is no demand for round tonnage, sales being limited to small lots. Prices are lower on heavy melting steel, \$13.50 being the general quotation. However, dealers are asking \$14 for new heavy steel scrap. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton.	
Old steel rails, rerolling	\$15.00 to \$15.50
Old iron rails	17.50 to 18.00
Steel car axles	18.75 to 19.25
Heavy melting steel	13.25 to 13.50
Old car wheels	15.00 to 15.50
Rerolling rails, 50 lb. and over	23.00 to 23.50
Agricultural malleable	12.50 to 13.00
Railroad malleable	14.00 to 14.50
Light bundled sheet scrap	12.50 to 13.00

Per Net Ton.	
Iron car axles	\$22.00 to \$22.50
Cast borings	7.75 to 8.00
Iron and steel turnings and drillings	7.50 to 8.00
Steel axle turnings	9.25 to 9.50
No. 1 busheling	11.75 to 12.25
No. 1 railroad wrought	13.50 to 14.00
No. 1 cast	13.00 to 13.50
Stove plate	10.00 to 10.50
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, January 29, 1913.—(By Telegraph.)

Pig Iron.—The expected improvement in the Southern situation has not developed. No. 2 foundry iron is being sold by a number of the Tennessee furnaces at \$13.50, Birmingham basis, for first half delivery, and it is rumored that a few special customers have been able to take on small lots at this figure for shipment through the entire year. It is also reported that some resale Alabama iron is obtainable at the same figure, but only for nearby delivery. The price of \$14 is being strictly adhered to by several Alabama producers, and in a number of medium-sized contracts this figure has been inserted on first half delivery material. No change is reported in the Hanging Rock district, and quotations range from \$16.50 to \$17. Iron-ton, with the first named price generally inserted in contracts for first half shipment. Although there was previously more interest taken in last half business, buyers now appear to be holding off, and with the exception of the higher level in prices the situation is almost identical with that existing last year at this time. Northern basic is firmer than foundry iron, but malleable is about on the same level as the latter and is freely quoted at \$16.50, Iron-ton basis. Among sales reported are 700 tons of Southern foundry iron to a central Ohio melter, 500 tons of low phosphorus to a West Virginia user and miscellaneous lots of both Northern and Southern foundry grades. A northern Ohio melter is asking for a round tonnage of Southern foundry iron for shipment in the next three months and the deal will probably be closed this week. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Iron-ton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	\$17.00 to \$17.50
Southern coke, No. 2 foundry and 2 soft	16.75 to 17.25
Southern coke, No. 3 foundry	16.50 to 17.00
Southern, No. 4 foundry	16.25 to 16.75
Southern gray forge	16.00 to 16.50
Old silvery, 8 per cent. silicon	20.70 to 21.20
Southern Ohio coke, No. 1	18.20 to 18.70
Southern Ohio coke, No. 2	17.70 to 18.20
Southern Ohio coke, No. 3	17.45 to 17.70
Southern Ohio malleable Bessemer	17.70 to 18.20
Basic, Northern	18.20 to 18.70
Lake Superior charcoal	19.25 to 19.75
Standard Southern car wheel	27.25 to 27.75

(By Mail)

Coke.—An increasing output is reported in the Connellsville field, due largely to improved labor conditions, but spot shipment quotations are still at high water mark and leading 48-hr. brands are bringing from \$3.75 to \$4 per net ton at oven. Contract figures range from \$3.25 to \$3.50, but very little such business is being booked or in sight at the moment. Prompt shipment foundry coke is quoted around \$4 to \$4.50 per net ton at oven, and first half prices are around \$3.50 to \$3.75. Foundry coke shows more activity, and as the supply is limited in both the Wise County and Pocahontas districts it is being sold there on about the same basis as Connellsville. The demand for domestic coke is on the decline, but this is only considered a temporary situation.

Finished Material.—Structural material, including reinforcing concrete bars, is in the lead, as far as the demand is concerned, although sheets are not dragging by any means. The question of delivery on time is a bothersome proposition that will hardly change for several weeks, if then. The majority of mill agencies look for the shortage to last through the entire year. Local warehouse prices on structural material remain at 2.15c. to 2.20c. and on steel bars around 2.05c. to 2.10c.

Old Material.—The market is weak. There is little demand from the larger users, while the offerings of scrap are larger than can be taken on by local dealers. As a consequence, prices have been reduced on nearly all grades about 25c. a ton. The quotations given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum figures are dealers' prices, f.o.b. at yards:

Per Gross Ton.	
Bundled sheet scrap	\$10.50 to \$11.00
Old iron rails	14.00 to 14.50
Rerolling rails, 50 lb. and up	21.00 to 21.50
Rerolling steel rails	13.00 to 13.50
Melting steel rails	11.00 to 11.50
Old car wheels	12.75 to 13.50

Per Net Ton.	
No. 1 railroad wrought	\$11.00 to \$11.50
Cast borings	7.00 to 7.50
Steel turnings	7.50 to 8.00
No. 1 cast scrap	10.75 to 11.25
Burnt scrap	7.75 to 8.25
Old iron axles	18.25 to 18.75
Locomotive tires (smooth inside)	12.00 to 12.50
Pipes and flues	7.50 to 8.00
Malleable and steel scrap	9.25 to 9.75
Railroad tank and sheet scrap	6.25 to 6.75

Birmingham

BIRMINGHAM, ALA., January 27, 1913.

Pig Iron.—The Southern iron market has displayed further evidence of weakness. Sales approximating 1200 tons, of which the largest lot was 500 tons, were made recently around \$13.50 or at a fractional discount under that figure. A brokerage firm, among other small sales, made one of 200 tons of No. 4 at \$12.75, which is on the \$13.75 basis for No. 2. The same contributing causes exist, namely, resale merchant iron, Tennessee iron (where a lower freight rate is enjoyed), and one furnace's accumulations in Alabama. One new stack began operations in December and its current output is also understood to be for sale on the \$13.50 basis to the extent of what the operators do not require for their own needs. It is agreed that a large tonnage could be purchased for first and second quarters at \$13.50. Even at the \$13.50 offering, very little business has been done. A bid of \$12 for 600 tons of No. 4, deliverable 100 tons per month, by a large stove foundry, was declined. The buyers' attitude is of waiting for further reductions, while that of the average furnaceman is of holding firmly to the \$14 minimum until a good buying movement sets in. Carload lots have been sold at \$14 to \$14.50. The four largest producers are not known to have sold any iron under \$14. Several inquiries for export have been received and an export freight rate of 18 shillings, good for June and July sailings, has been made, but no bookings are reported. The Tennessee Company will, in the immediate future, ship 4000 tons of steel rails from Ensley via Savannah, Ga., to Shanghai, China. Charcoal iron continues firm, with furnaces well booked for the first half of the year. Quotations, bearing the various sellers' attitudes in mind, are as follows:

No. 1 soft and foundry	\$14.00 to \$14.50
No. 2 soft and foundry	13.50 to 14.00
No. 3 foundry	13.25 to 13.75
No. 4 foundry	13.00 to 13.50
Gray forge	12.75 to 13.25
Basic	13.50 to 14.00
Charcoal	25.00 to 25.50

Cast-Iron Pipe.—Manufacturers do not report any additional large business, but have received a satisfactory volume of orders for maintenance and repairs. Stocks have begun to accumulate on some yards with expectancy of early absorption. Prices remain as last quoted, namely, 4 in., \$24.50; 6 in. and upward, \$22.50, with \$1 added for gas pipe.

Coal and Coke.—Coal is moving freely, but continues to demand high prices on account of exhausted yards. The entire output of the Searles mine of the Alabama Consolidated Coal & Iron Company for the year has been purchased by the Tennessee Company for use in the by-product plant at Ensley, which is working double turn. The policy of the Tennessee Company is to pile up raw material against possible contingencies.

Foundry coke is still in brisk demand and is selling at \$4 per net ton at oven.

Old Material.—Dealers report a fair volume of business and firmer prices. Stocks have not accumulated on yards, owing to prices asked. Relaying rails are in good demand and have been disposed of in fair quantities. Quotations of dealers, per gross ton, f.o.b. yards, remain as follows:

Old iron axles	\$15.50 to \$16.00
Old steel axles	15.50 to 16.00
Old iron rails	15.50 to 16.00
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	11.50 to 12.00
No. 1 country wrought	9.50 to 10.00
No. 2 country wrought	9.00 to 9.50
No. 1 machinery cast	11.50 to 12.00
No. 1 heavy melting steel	11.50 to 12.00
Tram car wheels	12.00 to 12.50
Standard car wheels	12.50 to 13.00
Light cast and stove plate	9.50 to 10.00

Boston

BOSTON, MASS., January 28, 1913.

Old Material.—Prices have receded, but the change is more sentimental than otherwise, the few transactions affording no real line on the market. The reduction is 50c. a ton. The quotations given below are based on prices offered by the large dealers to the producers and to the small dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of \$2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	\$11.25 to \$11.50
Low phosphorus steel	13.50 to 14.50
Old steel axles	14.50 to 15.00
Old iron axles	22.50 to 23.00
Mixed shafting	13.50 to 13.75
No. 1 wrought and soft steel	11.25 to 11.50
Skeleton (bundled)	9.50 to 9.75
Wrought iron pipe	10.00 to 10.25
Cotton ties (bundled)	9.50 to 9.75
No. 2 light	4.00 to 4.50
Wrought turnings	7.75 to 8.00
Cast borings	7.50 to 7.75
Machinery, cast	13.50 to 14.00
Malleable	10.50 to 11.00
Stove plate	8.50 to 9.00
Grate bars	7.50 to 7.75
Cast-iron car wheels	13.50 to 14.00

St. Louis

ST. LOUIS, MO., January 27, 1913.

The market continues quiet, especially as to large new business, but there is no discouragement among either consumers or sellers at the present state of affairs. The movement forward under contract generally is good and representatives are not altogether averse to letting matters rest for the moment.

Pig Iron.—What has generally been quietly understood for some little time as to Southern pig has become open in this market, and No. 2 foundry grades are quoted at \$13.50, the price at which, Birmingham basis, No. 2 could really have been bought for some little time. This is for second quarter as well as first, but later dating lifts the price a shade. A report has been current of a large purchase of basic at an outside point for shipment into this territory, but this is believed to have arisen from a small purchase made in Birmingham for shipment here, together with a threat from still another consumer to buy because deliveries on an existing contract were not satisfactory. The latter condition was adjusted and the purchase has not been made. For the most part the sales and inquiries of the past week have been for 100 and 200 tons. The inquiry reported for 2000 tons of malleable remains unfilled. Requisitions on contract continue as urgent as ever, and movement is improving as the car situation changes.

Coke.—The business which has been done during the week has been in small lots at quotations which remain unchanged in any material way from last week. Urgency in movement on contracts is still noted, indicating that melting of iron is going on unabated. By-product coke is quoted at present on a parity with the Connellsville figures.

Finished Iron and Steel.—The run of orders in all branches is reported as keeping up to the pace of recent weeks, but there is no large new business to report. Architects state that a considerable amount of new work is on the boards which will undoubtedly come out with the breaking of winter. Bars are in excellent demand for construction work, and fabrica-

tors are doing their best to get structural material ahead for the spring season. They are giving orders reaching into the fourth quarter and report no discouraging signs. Agricultural machinery and wagon makers are taking all the material they can get and are making purchases in addition to their regular contract lots. In steel rails there was a small sale to a Texas road, but no further business. Track fastenings are in good demand.

Old Material.—While a slightly softer feeling exists, there has been no further recession of prices, and with severe weather a stiffer feeling is likely because of the cutting off of supplies from the railroads especially. The mills are buying some scrap, but only as they want it or can pick up what appears to them to be a bargain. The tendency in prices will largely be determined by the character of the offerings which the railroads will make with their first of the month lists due the coming week. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton.	
Old iron rails	\$14.00 to \$14.50
Old steel rails, re-rolling	15.00 to 15.50
Old steel rails, less than 3 ft.	13.50 to 14.00
Relaying rails, standard section, subject to inspection	23.50 to 24.00
Old car wheels	15.50 to 16.00
Heavy melting steel scrap	13.25 to 13.75
Frogs, switches and guards cut apart	13.00 to 13.50

Per Net Ton.	
Iron fish plates	\$12.50 to \$13.00
Iron car axles	20.50 to 21.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	12.50 to 13.00
No. 2 railroad wrought	12.00 to 12.50
Railway springs	11.00 to 11.50
Locomotive tires, smooth	12.50 to 13.00
No. 1 dealers' forge	9.00 to 9.50
Mixed borings	7.00 to 7.50
No. 1 busheling	10.50 to 11.00
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
No. 1 cast scrap	12.00 to 12.50
Stove plate and light cast scrap	8.50 to 9.00
Railroad malleable	11.50 to 12.00
Agricultural malleable	10.00 to 10.50
Pipes and flues	7.50 to 8.00
Railroad sheet and tank scrap	7.25 to 7.75
Railroad grate bars	9.50 to 10.00
Machine shop turnings	8.75 to 9.25
Bundled sheet scrap	7.50 to 8.00

The German Iron Market

Continued Scarcity of Pig Iron and Steel

BERLIN, January 16, 1913.

The situation has grown rather better as far as any change can be observed. Manufacturers are holding firmly to previous prices, and they assign no importance to recent underbidding in bars on the part of dealers. The prospect for the spring trade is regarded as bright, provided that no further political disturbances intervene. It is even probable that higher prices will be adopted soon in certain lines. The mills and furnaces continue working at full capacity everywhere. Scarcity of pig iron and semi-finished steel continue to be the most striking characteristic of the trade.

Overcoming the Car Famine

Ores have accumulated at the mines to a considerable extent within the past two months owing to the shortage of cars to move them. The demand from the furnaces has continued urgent, and as the railroad authorities have now about overcome the car famine the movement is in larger volume. In the Siegerland and adjacent districts the mines are sold out for the first half year at least. It is believed among mine owners that an advance in pig-iron prices will probably be made for the next half year if the present strength of the market is maintained, and in that case a moderate advance in ore prices would also be made. From the Lorraine-Luxemburg district it is reported that the demand for minettes has grown heavier, and the mines that still operate for the open market are not fully able to supply the demand. The market for foreign ores continues remarkably firm, but Russian ores can now be obtained at somewhat better terms owing to the recent relaxation of ocean freight rates.

The Pig-Iron Syndicate has circularized its customers to the effect that it is able to supply only small amounts of Luxemburg qualities for the rest of the half-year, in occasional lots of not above 10 tons. According to a report in the trade the organization lacks 100,000 tons of being able to meet the demands for Luxemburg iron for the period in question. Foundries are still greatly hampered through delays in arrivals of iron, but the Syndicate is unable to meet their urgent demands. Among some classes of consumers—appar-

ently of Luxemburg qualities—there is a discussion going on of trying to obtain a substitute grade from England. So far as the price is concerned, it is reported that members of the Syndicate regard it improbable that a further advance will be made, or at any rate the advance will be small if one is voted at all. The Syndicate is deferring its decision, evidently pending the solution of pending political questions, and with the hope of raising prices if peace is established at an early date.

In semi-finished steel products the position is extremely strong. The available supplies are far from meeting the requirements of home and foreign consumers. The home demand is so extensive that foreign orders are being held off in some cases, or even rejected outright. England continues to send in big orders, and American buyers are also in the Continental markets, apparently including Germany. Export orders will reach well into the second quarter, and foreign buyers are disposed to place orders for considerably longer periods. The price situation is at this moment unsettled. The Union holds a meeting next week for the purpose of adopting a scale for the home market for the next quarter, and it is regarded as quite probable that a small increase will be made if the political situation seems to warrant it. It is not improbable, however, that a postponement of action will be decided upon if the question of peace or a resumption of hostilities shall not have been settled in the meanwhile.

Structural Shapes, Bars and Plates

In structural shapes for the building trade business is quiet, in keeping with the season, but there is great variety in material for construction shops, which are very busy. Foreign markets are absorbing structural products readily, especially beams; the mills have orders in hand for four to five months ahead at prices ranging between 113 and 115 marks f.o.b. Mills running on rails are very busy, and foreign markets in particular are actively buying. The December shipments of rails were the heaviest since last March.

The bar market continues quiet. Dealers still hold aloof, buying only such amounts as are needed for near-by requirements. The mills, however, are adhering firmly to prices, averaging about 125 marks for the home trade. The great Hoesch establishment at Dortmund, which has become the pacemaker for a number of other establishments, has just given out its list for the second quarter, showing unchanged prices. There is considerable buying in high-grade wrought bars. Work in bands is already engaged to the end of the half-year; foreign prices have recently risen 1 to 2 marks. The demand for cold-rolled bands continues very heavy, and a further advance on the price of 210 marks adopted several months ago is regarded as probable.

The prospects for the plate orders from the ship-building industry continue good, further orders for new steamers having been placed this week. Several other works have now rejoined the Kontor controlling ship plates, hence this organization is in better shape than several weeks ago. There are still large foreign orders in hand for ship plates, especially from England, Holland, Norway, Denmark and Sweden. A more active demand for boiler and construction plates is regarded as probable within a short time—provided always that the international political horizon clears up. Business in hand in thin plates will keep the mills employed for some four months, but new orders from the home trade are rather slack. In medium thicknesses business continues very good; and this is also the case with tin plates.

Tubes, Rods, Steel Castings and Hardware

Better prices are being obtained for tubes, now that older orders are being worked off. In gas and boiler pipe large orders are on the books, and new business is coming in at a satisfactory rate. Cast-iron pipe is also doing well, and an advance of prices in keeping with the high cost of pig iron is expected.

The new business in wire rods is heavy and continues to exceed allotments. In view of the heavy employment of American wire mills and the advance of wire nails in France and Belgium, it is hoped that higher prices may be shortly obtained for the latter in Germany also. The advance adopted in northern France was 3.50 francs per 100 kilograms.

Foundries producing steel castings are doing an unusually good business. Their orders are fully 50 per cent greater than a year ago, and prices are also higher.

In the hardware trade employment is somewhat irregular. Branches mainly dependent upon the home trade are mostly doing well, while some of those working chiefly for export are complaining of slow sales. Shops producing special wares for household use are actively employed in replenishing stocks depleted by the Christmas trade.

British Pig Iron Still Weak

Affected by American Situation—
Welsh Tin Plate Mills Not Yet Down

(By Cable)

MIDDLESBROUGH, ENGLAND, January 29, 1913.

The pig iron market is disturbed by politics and by the less favorable advices from America. The Welsh tin-plate makers are still considering a shutdown. General trade is quieter but there are no further price recessions to report except iron warrants which are softer. The stocks of warrant iron are 237,165 tons against 239,245 tons last week. We quote as follows:

Cleveland pig iron warrants (closing Tuesday) 65s. 3½d. against 65s. 5d. last week.

No. 3 Cleveland pig iron, makers' price, f.o.b. Middlesbrough, 65s. 9d., the same as last week.

Steel sheet bars (Welsh) delivered at works in Swansea Valley, £5 17s. 6d.

German sheet bars, f.o.b. Antwerp, 112s. 6d.

German 2-in. billets, f.o.b. Antwerp, 107s. 6d.

German basic steel bars, f.o.b. Antwerp, £6 2s.

Steel bars, export, f.o.b. Clyde, £8 5s.

Steel joists, 15-in., export, f.o.b. Hull or Grimsby, £7 7s. 6d.

German joists, f.o.b. Antwerp, £5 12s. to £5 15s.

Steel ship plates, Scotch, delivered local yard, £8 7s. 6d.

Steel black sheets, No. 28, export, f.o.b. Liverpool, £9 15s.

Steel rails, export, f.o.b. works port, £6 15s.

Tin plates, cokes, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 15s.

Speculation on Southern Pig Iron Shipments Into England

(By Mail)

MIDDLESBROUGH, January 17, 1913.

The general feeling here is still pretty good for local makers of pig iron refuse to admit the possibility of any harm coming to the situation for quite a while yet; but there is no disguising the sloppy tendency which at intervals has dominated the warrant iron market, and which sprang in the first instance, mainly from the December returns of output in the United States. These figures gave the speculative element a jar, for people troubled with all sorts of unpleasant complications in connection with the Balkan situation, which is causing a lock up of capital, refuse to believe that your consumption can take care of the great quantity of raw iron now being turned out by your furnaces. The slump in copper also has affected sentiment adversely, and it is argued that if the copper trade is falling off, then it cannot be long before iron and steel get off the boil. It is certain that not all your furnaces are quite comfortable, for in the South negotiations are continually being opened up with London and Glasgow houses regarding export business of importance. One of the largest firms reports that it is getting daily offers of iron from the South, and that at a trifle less than the sellers' ideas it would take a large quantity. It is believed that very soon Southern iron can be picked up at prices at which it will compete effectively with British iron in the Manchester district. The sale of a 1000-ton lot of Alabama or Tennessee iron to England would take all the starch out of the British market; not that there is much left at the time of writing, though there is always the possibility of a rallying movement owing to the big short account in Cleveland. Meantime a very moderate rise in the price of English iron, or an equally moderate drop in the American price, or in freights, would release United States pig iron in Manchester, and this would certainly hit the general market a hard blow.

Semi-Finished Steel

The tone of finished materials remains pretty good; at least nobody will consider the possibility of lower

prices. But if the omens are to be trusted and raw materials are coming down, it is futile to affect that the price of finished iron and steel is going to remain uninfluenced. There is not much new buying in progress and has not been since the year opened, but the Birmingham meeting last week found makers in a jovial frame of mind, encouraged by the congested state of their order books. The Germans are sold up to an astonishing extent in semi-finished steel, and this is indeed the strongest section of the market; but let it be remembered that it is but a section and not necessarily indicative of the whole position. Even as far as billets and sheet bars are concerned, there must be a relaxation soon, for the tin plate works are shutting because they cannot get orders, and in the galvanized sheet trade things are the reverse of brilliant. The entire position indeed needs to be closely watched.

High Ore and Coal

It is the opinion of some of the biggest ore people that prices of iron ore are pretty well at their zenith, and in this belief they are trying to market every ton possible. Within the last few days some North African ore has been sold to furnaces at the top price, but the buyers were accustomed to working this class of raw material and feared that they might get caught short, for they had delayed buying till their stock pile was getting low. On the other hand the users of Spanish Rubio are standing aside, declaring that they cannot afford to pay the 23s. to 23s. 6d. demanded for supplies, c.i.f. Tees. Buyers might pay 22s. 6d. Fuel is also too dear and some reduction is almost certain before very long. D. A. Thomas, the head of the great Cambrian group of collieries in South Wales, is now on his way to the bituminous coal fields of the United States nearest the Atlantic coast, which he believes can deliver coal at British ports at lower prices than the coal owners of the United Kingdom. If it turned out that a considerable tonnage of American coal was booked for England, there would almost certainly be a modification of the ideas of our colliery owners, who are reaping a fine harvest.

Buffalo

BUFFALO, N. Y., January 28, 1913.

Pig Iron.—New buying for the week has been of small volume, the lightest for some time past. Contract specifying continues to be heavy and shipments from furnaces are going forward in unprecedented volume. Weather conditions have been perfect for large production at furnaces and also for railroad transportation in forwarding furnace product promptly. One foundry iron producer shipped out 60 cars of various grades a week ago Monday and the average daily shipment for the preceding week was proportionately large. Prices remain substantially the same as for the previous week, with the following range, f.o.b. Buffalo:

No. 1 foundry	\$17.50 to \$18.25
No. 2 X foundry	17.25 to 18.00
No. 2 plain	17.00 to 17.75
No. 3 foundry	16.75 to 17.50
Gray forge	16.50 to 17.25
Malleable	17.25 to 18.00
Basic	18.00 to 18.25
Charcoal, regular brands and analysis	18.00 to 19.00
Charcoal, special brands and analysis	21.75

Finished Iron and Steel.—Considerable material has been placed in this district for delivery over the last half of the year. Mills as a rule are entirely out of the market so far as first half delivery is concerned. It is believed there is a comparatively small proportion of mill output for sale for last half delivery. For this reason a good many of the mills are accepting business with some degree of reluctance even for last half and from indications the real problem is going to be the securing of steel by consumers rather than the matter of price. One of the principal local mills for last half contracts requires specification in equal monthly allotments, such specification to be made prior to the fifteenth of each month with shipment before the end of the following month, or six weeks from date of specification. This applies to contracts for bars, plates and shapes. The demand for sheets, both black and galvanized, is heavy and prices are exceedingly firm. In fabricated structural lines the week has shown increased activity. Bids are to be received February 4 for 700 tons for a 107 x 400-ft. foundry building for the Otis Elevator Company in Buffalo. Bids for 1500 tons on final revised plans for the Hutchinson

High School, Buffalo, are to be opened February 21. The Buffalo Structural Steel Company has taken between 1400 and 1500 tons for the Masten Park High School and Charles F. Ernst's Sons, Buffalo, has the steel work for the town hall at Depew, N. Y.

Old Material.—The market has been decidedly dull for the week, with small transactions in all lines and with a consequent softening in prices. This, however, does not apply to old car wheels, for which demand continues fairly active. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel	\$14.50 to \$15.00
Low phosphorus steel	16.50 to 17.00
No. 1 railroad wrought	15.00 to 15.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	16.00 to 16.50
Old iron axles	23.00 to 23.50
Old car wheels	16.50 to 17.00
Railroad malleable	13.50 to 14.00
Boiler plate sheared	14.50 to 15.00
Locomotive grate bars	11.00 to 11.50
Wrought pipe	10.00 to 10.50
Tank iron	10.25 to 10.50
Wrought-iron and soft steel turnings	8.50 to 8.75
Clean cast borings	8.00 to 8.25

New York

NEW YORK, January 29, 1913.

Pig Iron.—There is less activity than was noted a week ago. Naturally in such a time of waiting an occasional transaction develops which indicates more eagerness to sell on the part of some furnaces, particularly those recently started up after a long inactivity, than is shown by producers whose books are pretty well filled. An instance which received attention in the past week was the purchase of 1000 to 1200 tons of iron for second and third quarter delivery at Plainfield, N. J. It is understood that this business was taken at close to \$17.25 at Eastern Pennsylvania furnace, which is 50 cents less than the price a number of companies have maintained for some time. Purchases by a stove foundry at Troy, N. Y., were divided between Lake Champlain and Lake Ontario furnaces. The fact is commented on that foundries are taking iron with regularity, and that in the main foundry operations are holding up quite well. Some business in Eastern New York and New England has been done lately on a basis indicating the willingness of one or two furnaces at least to shade the prices which prevailed in December and the early portion of this month. Not enough business is going, however, to give a good indication of general market tendencies. It will take a broader demand to show what the next buying movement will develop as to prices. It is the view of some sellers who are not disposed to look for any considerable buying before the latter part of February, that present prices will be in force at that time, whatever slight variations may be shown by relatively small transactions meanwhile. We quote as follows for Northern iron at tidewater: No. 1 foundry, \$18.75 to \$19; No. 2 X, \$18.25 to \$18.50; No. 2 plain, \$18 to \$18.25. Southern iron is quoted at \$18.75 to \$19 for No. 1 foundry and \$18 to \$18.50 for No. 2.

Structural Material.—The subway extensions being built by the city of New York constitute a market feature of leading interest, bids involving 12,000 tons for work in Queens having been received at Tuesday noon from general contractors. Some 22,000 to 24,000 tons additional for early awarding is also being figured on and the work calls attention again to the total amount of structural material which will be needed for the inter-city transportation lines, aggregating perhaps 400,000 tons. The seasonable quiet still obtains, but there is considerable inquiry, though chiefly for small propositions. The railroads have not yet been heard from to any extent for bridge material. Of recent awards may be mentioned the following railroad bridges, however: 600 tons for the Boston & Maine in Hoosick, N. Y., to the Boston Bridge Works; 150 tons for the Delaware & Hudson, Binghamton, to the American Bridge Company; 450 tons for the Central of New Jersey, over the Shrewsbury River, to the Pennsylvania Steel Company; 250 tons for the Central of New Jersey for round house and other buildings at Communipaw, to the Belmont Bridge Company; 200 tons for Pier 39, North River, for the Pennsylvania Railroad, to the Belmont Bridge Company. Other awards include 500 tons for the People's National Bank, Lynchburg, Va., to the Virginia Bridge & Iron Company; 525 tons for column cores, Metropolitan Building, Philadelphia, to the Belmont Bridge Company; 500 tons for a Lehigh Valley coal breaker,

Wilkes-Barre, to the York Bridge Company; 1000 tons for a manufacturing building at Ludlow, Mass., to Leveing & Garrigues Company, and 500 tons for a bank at Mobile, to the Jones & Laughlin Steel Company. The Boston & Maine is inquiring for three bridges involving 600 to 700 tons, and the total work now pending for additional terminal work for the New York Central in New York amounts to 1200 to 1400 tons. George F. Payne & Co., Philadelphia, is mentioned as a general contractor for the Widener Library, Harvard University, requiring 850 tons. Plain material is quoted at 1.66c. to 1.76c., New York, mill shipment, the former for delivery in third quarter and the latter for, say, three months. From store the price is 2.25c., New York.

Plates.—With an inquiry for 12,300 cars, including 8000 steel coke cars for the Pennsylvania Lines, East and West, and the 12,733 cars pending for the Harri-man Lines, it is figured that about 30,000 cars will be placed in the next two or three weeks. The Norfolk & Western at this writing is about to decide, it is stated, with regard to the purchase of 1000 to 8000 cars; it is expected that the Chesapeake & Ohio will determine on its purchase of 1000 to 3000 coal and coke cars in the latter part of next month, as will the Buffalo, Rochester & Pittsburgh on 24 passenger cars. Early in February a decision is expected from the Atlantic Coast Line on 1000 box cars and 300 flat cars. The New Haven is inquiring for 25 baggage cars and 17 postal cars; the Louisville & Nashville for 500 gondolas, and the Baltimore & Ohio for 1000 hopper and 300 refrigerator cars. Recent awards include 1000 gondolas for the Illinois Central, to the Pullman Company; 35 passenger equipment cars for the Delaware, Lackawanna & Western, to the Barney & Smith Company, and 1000 cars for the Baltimore & Ohio, to the Cambria Steel Company. In ship plates the Lukens Iron & Steel Company has taken 450 tons for two barges to be built by the T. S. Marvel Shipbuilding Company, Newburgh, for use in Panama Canal works, and also the ship and boiler plates for two tug boats. There is a rumor that another fuel ship of size is to be built at the Brooklyn Navy Yard. General quotations for plates remain 1.66c., New York, for mill shipment in the third quarter, and 1.76c. for sheared plates and 1.81c. for universal plates in the first quarter.

Iron and Steel Bars.—Specifications on contracts for steel bars are much heavier than they were at this time a year ago. With regard to contracting, large consumers have not been of one mind, one large company, for example, having signed a contract for the entire year, while another is satisfied with a contract for the first half alone. The representative of one large company has observed in general finished steel lines a wave of buying and asserts that while movement out of jobbers' stocks may not be so heavy as it was of recent date, nevertheless the actual stocks in jobbers' warehouses are very much depleted. The bar iron business is still heavy, and in spite of a price of 1.80c., New York, for carload lots obtaining with one company for some time, that company is receiving business at a rate beyond its capacity. Steel bars remain at 1.40c., Pittsburgh, or 1.56c., New York, delivery at the convenience of the mill, but 2.10c., from store. Refined iron bars are quoted at 1.75c. to 1.80c., New York, and from store, 2.15c.

Cast Iron Pipe.—Boston bids on 3160 tons, opened January 27, showed a decided variation, the lowest being \$3 per net ton below the highest. The low price bid was somewhat of a surprise to other pipe manufacturers. Public lettings are not coming out rapidly, but private buyers are showing increased interest in the market and in this respect conditions may be said to be improving. An inquiry is out from a buyer in Roumania who desires quite a large quantity of cast iron pipe. Quotations on carload lots of 6 in. are \$25 to \$26 per net ton at tidewater.

Ferroalloys.—Both spot and future delivery 80 per cent. ferromanganese are practically nominal at \$65, Baltimore. The market is quiet, although there is inquiry out for about 200 tons for prompt delivery. Small lots of ferromanganese which are held outside of regular hands have been offered at prices slightly shading \$65. Consumers continue anxious for deliveries on contracts. Ferrosilicon is quiet and unchanged at \$75, Pittsburgh, for carloads; \$74 for 100 tons, and \$73 for 600 tons and over.

Old Material.—Consumers of steel scrap are either overstocked or have their wants amply covered by contract, and are doing little or no buying. Practically the only transactions in steel scrap are among dealers, round lots having changed hands in this way within the

past week on the basis of about \$14 delivered at steel works in eastern Pennsylvania. Rolling mills are purchasing no material running up in tonnage but are taking merely odd lots and especially such small quantities as are being offered below what might be considered the market. The foundries are not buying as well as in the early part of the month, probably being influenced by the weakening tendency in pig iron. Car wheels are also in less demand. Dealers' quotations are as follows, per gross ton, New York and vicinity:

Old girder and T rails for melting.....	\$11.50 to \$12.00
Heavy melting steel scrap	11.50 to 12.00
Relaying rails	22.50 to 23.00
Rolling rails	14.00 to 14.50
Iron car axles	24.00 to 24.50
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.00 to 13.50
Wrought iron track scrap	12.50 to 13.00
No. 1 yard wrought, long	12.00 to 12.50
No. 1 yard wrought, short	11.50 to 12.00
Light iron	5.00 to 5.50
Cast borings	8.00 to 8.50
Wrought turnings	8.50 to 9.00
Wrought pipe	10.25 to 10.75
Old car wheels	15.00 to 15.50
No. 1 heavy cast, broken up	11.50 to 12.00
Stove plate	9.00 to 9.50
Locomotive grate bars	9.00 to 9.50
Malleable cast	11.00 to 11.50

Metal Market

NEW YORK, January 29, 1913.

The Week's Prices

		Cents Per Pound for Early Delivery.					
Copper, New York.		Electro-lytic.	Tin, New York.	Lead, New York.	St. Louis.	Spelter, New York.	St. Louis.
Jan.	Lake.						
23.....	16.50	16.25	50.10	4.35	4.20	7.00	6.85
24.....	16.50	16.30	49.87½	4.35	4.20	7.00	6.85
25.....	16.50	16.30	.....	4.35	4.20	7.00	6.85
27.....	16.50	16.30	49.85	4.35	4.20	7.00	6.85
28.....	16.50	16.30	49.90	4.35	4.20	6.90	6.75
29.....	16.50	16.30	50.40	4.35	4.20	6.90	6.75

Copper is quiet, but steady, in a waiting market. Tin is down to the import price basis again and the market is dull. Lead is unchanged. Spelter is lower. Antimony is very quiet and some brands are weaker.

New York

Copper.—The copper market, which is steady, has been very dull since Friday. About the middle of last week very large sales were made, especially for export but the increased activity was brought to a close by a slump in London prices, caused by a renewal of uncertainty regarding the Balkan situation. While prices did not go down here to the extent they did in London, the disturbance was sufficient to bring an end to the buying movement. The present situation is one where all seem to be awaiting events, particularly those abroad. Electrolytic is quoted to-day at 16.30c., cash, 30 days, or 16.42½c., cash, 30 days, delivered in the Naugatuck Valley. Lake is held by several producers at 16.50c., cash, New York. Brass sheets, wire and rods were reduced ¾c. on Saturday and copper wire also is down a fraction of a cent. It is reported and generally credited that some second hands are speculating in futures, their faith in lower prices being such that they are willing to sell short. The price in London to-day is £68 15s. for spot and £69 2s. 6d. for futures. Exports have improved and the total for the month is 21,050 tons.

Pig Tin.—The market has been dull since the last report. The arrival of the Mesaba from London with 860 tons of tin and the Minneapolis from the same port with 650 tons have relieved the spot situation and the metal is now back to the import price basis. Quiet is promised for the next few weeks inasmuch as February and March tin was freely traded in in November and December. Tin is quoted to-day at 50.40c., though throughout the better part of the week it has been under 50c. The price in London to-day is £229 10s. for spot and £225 for futures. The arrivals total 4169 tons and there is afloat 2375 tons. The sale of 2500 tons of Banca tin in Holland to-day went at 137¼ florins, equal to about 50c., c.i.f. New York, which is considered a very fair price.

Lead.—There has been no change in this metal, which is quoted at 4.35c., New York, and 4.20c., St. Louis. The demand continues fairly good.

Spelter.—The weak tendency in spelter resulted yesterday in another drop in price when 6.90c., New York, and 6.75c., St. Louis, were quoted with still lower prices for distant delivery. The metal has been very unsettled for various reasons, including tariff fears, the quiet market and steady production.

Antimony.—This metal continues very dull, the market being described by some as stagnant. Hallett's is practically unchanged at 9.25c. to 9.50c. but Cookson's has touched a lower level and is now quoted at 9.50c. to 9.75c. Chinese and Hungarian grades are weaker also and are quoted at 8.75c. to 9c. Consumers continue to show no disposition to enter the market.

Old Metals.—The market is unsettled. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible.....	15.50 to 15.75
Copper, heavy and wire.....	15.25 to 15.50
Copper, light and bottoms.....	14.25 to 14.50
Brass, heavy.....	9.75 to 10.00
Brass, light.....	7.75 to 8.25
Heavy machine composition.....	13.25 to 13.50
Clean brass turnings.....	9.00 to 9.50
Composition turnings.....	12.00 to 12.50
Lead, heavy.....	4.25
Lead, tea.....	4.00
Zinc, scrap.....	6.00

Chicago

JANUARY 28.—Heavy buying has checked the weakness in copper which prevailed a week ago, and while there has been no advance quotations are firm at the current level. Tin is off slightly and the weakness in spelter is more pronounced. Scrap values are somewhat lower. We quote as follows: Casting copper, 16.75c.; Lake, 17c., in carloads for prompt shipment; small lots, 1/4c. to 3/4c. higher; pig tin, carloads, 51c.; small lots, 53c.; lead, desilverized, 4.30c. to 4.35c. for 50-ton lots; corroding 4.60c. for 50-ton lots; in carloads, 2 1/2c. per 100 lb. higher; spelter, 7.10c. to 7.20c.; Cookson's antimony, 11.25c., and other grades, 10.50c. in small lots; sheet zinc is \$9, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 14.75c.; copper bottoms, 13.25c.; copper clips, 14.25c.; red brass, 12.75c.; yellow brass, 9.75c.; lead pipe, 4c.; zinc, 5.25c.; pewter, No. 1, 33c.; tinfoil, 38c.; block tin pipe, 43c.

St. Louis

JANUARY 27.—Metals have softened somewhat. Lead alone is unchanged at 4.20c; spelter is easy at 6.90c. bid, with little offering; tin stands at 49.85c. to 50.35c.; Lake copper, 16.85c. to 17.10c.; electrolytic, 16.75c. to 17c.; Cookson's antimony, 10.10c. In the Joplin ore market there was a recession in zinc blende, which brought \$57.50 per ton as a top price on an assay basis of \$54.50 for 60 per cent. Calamine was in good demand at \$28 to \$30 for 40 per cent., while the choicest grades brought as high as \$37. Lead ores were unchanged at \$53. On miscellaneous scrap we quote as follows: Light brass, 6.50c.; heavy brass and light copper, 10.50c.; heavy copper and copper wire, 13c.; pewter, 25c.; tinfoil, 36c.; zinc, 4c.; lead, 3.50c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, January 29, 1913.

The stock market appears to be drifting, without developing any general tendency. A few stocks, however, have shown some strength, notably American Can, Colorado Fuel and Lackawanna Steel. United States Steel stocks were under slight pressure for part of the week, due to an unfavorable interpretation of ex-President Corey's testimony in the dissolution suit. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Am. Can, com.....	28 1/2 - 38	Nat. En. & St., pref.....	92
Am. Can, pref.....	115 3/4 - 129 1/2	Pressed Steel, com..	32 3/4 - 33 1/2
Am. Car & Fdy., com.	52 1/2 - 53 1/2	Pressed Steel, pref.	101 - 102
Am. Car & Fdy., pref.....	116 1/2	Railway Spg., pref..	98 3/4 - 100
Am. Loco., com.....	39 - 40 1/4	Republic, com.....	24 - 24 3/4
Am. Loco., pref.....	105 3/4	Republic, pref.....	83 3/4 - 85
Am. Steel Foundries.....	35	Rumely Co., com....	88 1/2 - 89
Bald. Loco., com....	48 3/4 - 51	Rumely Co., pref....	98 - 98 3/4
Bald. Loco., pref....	104 - 104 1/4	Sloss, com.....	44 - 45 1/2
Beth. Steel, com....	37 1/4 - 39 1/4	Pipe, com.....	15
Beth. Steel, pref....	68 3/4 - 69 1/2	U. S. Steel, com....	62 3/4 - 65 1/4
Case (I.I.) Co., pref.	99 1/2 - 100 1/4	U. S. Steel, pref....	109 3/4 - 110 3/4
Colorado Fuel.....	33 - 36 1/4	Va. I. C. & Coke....	52 1/2 - 54
Deere & Co., pref....	99 1/2	Westinghouse Elec..	72 1/2 - 75
Emer-Brant, com....	64 - 65 1/4	Am. Ship, com.....	53 - 53 1/2
Emer-Brant, pref....	97	Am. Ship, pref.....	103 1/2
General Electric.....	141 1/2 - 142 3/4	Chic. Pneu. Tool....	50 1/2 - 51 1/2
Gr. N. Ore Cert.....	37 1/2 - 40	Cambria Steel.....	51 - 51 3/4
Int. Harv., com.....	106 1/2 - 112	Lake Sup. Corp....	30 - 30 3/4
Int. Harv., pref.....	113 - 116	Pa. Steel, pref.....	93
Int. Pump, com....	15 1/2 - 16 1/2	Warwick.....	11
Int. Pump, pref.....	66	Crucible Steel, com.	16 - 16 1/4
Lackawanna Steel....	43 - 46	Crucible Steel, pref.	93 - 93 1/2
Nat. En. & St., com.	17 - 17 1/4	Harb. Wk. Ref., com.	50 1/2 - 50 3/4

Dividends Declared

The Pressed Steel Car Company, regular quarterly, 1 3/4 per cent. on the preferred stock, payable February 19.

The J. G. Brill Company, regular quarterly, 1 3/4 per cent. on the preferred stock, payable February 19.

The Standard Sanitary Mfg. Company, regular quarterly, 1 3/4 per cent. on the preferred, and 1 1/2 per cent. on the common stock, both payable at once.

The United States Steel Corporation, regular quarterly, 1 3/4 per cent. on the preferred, payable February 27, and 1 1/4 per cent. on the common stock, payable March 29.

Personal

Russell Dale, previously associated with the Cel or Tool Company, and later with the Carpenter Steel Company as Chicago representative, has been appointed manager of sales for the Rich Tool Company, with offices at the company's headquarters, 410 Railway Exchange Building, Chicago. Instead of selling its output exclusively through Joseph T. Ryerson & Son, the Rich Tool Company will now handle its own sales.

George Bartol, president Otis Steel Company, Cleveland, Ohio, who has been very ill with pneumonia, has improved somewhat. While not entirely out of danger his early recovery is expected.

Harvey Higgins, Jr., has been made advertising manager of the Standard Tool Company, Cleveland, Ohio, manufacturer of twist drills, reamers, milling cutters, etc.

J. B. Rider, general manager, was elected a director of the Pressed Steel Car Company at a meeting of the board, January 22.

Sigmund Bergmann, formerly head of the Bergmann Electric Works, Berlin, Germany, which is now consolidated with the Siemens-Halske Company, Germany, is in this country on a visit. Mr. Bergmann some years ago was in business in this country and was an associate of Thomas A. Edison.

Frank H. Barker, formerly of the Carbon Steel Company, Pittsburgh, has been appointed general sales agent for the Electro Steel Company with offices at 413 Fort Dearborn Building, Chicago.

R. M. Hawkins, Jr., formerly of the Standard Welding Company, Cleveland, Ohio, has entered the employ of the Hill Clutch Company, Cleveland, as Eastern representative, connected with its New York sales office, located at 50 Church street.

Harold R. Wilson has severed his connection with the firm of Arthur S. Partridge, St. Louis, Mo., and has organized the H. R. Wilson Machinery Company, to conduct a second-hand electric and steam machinery business, with offices in the new Bank of Commerce Building, that city.

J. S. Fraser, superintendent of the Carnegie Steel Company's Neville and Edith furnaces at Neville Island and Allegheny, Pa., has been transferred to the same company's Clairton works, in charge of blast furnaces, succeeding Harry Kennedy, resigned.

L. S. Hussey has resigned his position as advertising manager of the Standard Tool Company, Cleveland, Ohio, to take effect January 30. He has not yet made any plans for the future, but will probably remain in Cleveland during a portion of February.

G. H. Jones, vice-president Inland Steel Company, left Chicago January 28 for a three weeks' trip to Panama.

David Evans, president Chicago Steel Foundry Company, has gone for a three weeks' West Indian cruise which will include an inspection of the Panama Canal.

Chester D. Tripp, Chicago, general manager Rogers-Brown Ore Company, will sail from New York February 8 for Panama and other points in the West Indies.

D. R. Hettelsater, formerly chief engineer of the Joliet Bridge & Iron Company, Joliet, Ill., has been appointed chief engineer for the recently organized Chicago Steel Products Company.

R. A. Dugan, president Calumet Foundry Equipment Company, who has been associated with the Scullin-Gallagher Iron & Steel Company as district sales manager at Chicago, has severed the latter connection and will devote himself to the interests of the former company.

C. L. Baker, formerly chief clerk of Neville and Edith furnaces of the Carnegie Steel Company, has resigned his position as chief clerk, Pittsburgh warehouse, Carnegie

Steel company, to accept a position as assistant to H. W. McAnis, comptroller Cambria Steel Company, Johnstown, Pa., effective February 1.

F. Mosedale, resident sales manager at Buffalo for M. A. Hanna & Co., who is taking a rest of a few weeks in the South, is at present at Daytona, Fla.

H. D. Westfall, for some years secretary and general manager of sales of the La Belle Iron Works, Steubenville, Ohio, has also been elected vice-president, succeeding W. D. Crawford, who was recently elected president. Mr. Westfall also continues as general manager of sales. R. C. Kirk, treasurer of the same company, has been elected secretary and will fill those two positions.

Isaac W. Frank, president United Engineering & Foundry Company, Pittsburgh, has returned from a seven months' trip to Europe.

John A. Topping, chairman of the Republic Iron & Steel Company, has gone to Florida and will probably spend February and March there.

Obituary

J. HARRY WESSLING, JR., secretary and treasurer of the Wessling Brothers Foundry Company, Cincinnati, Ohio, died at his residence in that city January 23, aged 53 years. He had been connected with the metal working industry practically all of his business life, having been employed by the Lunkenheimer Company when very young and by hard work reached the position of manager of the purchasing and city sales departments, which he held for several years. He resigned to go into business with his brother, A. G. Wessling. He leaves a widow. His brother will continue the business without change.

The Detroit Seamless Steel Tubes Company

Permanency of the business of the Detroit Seamless Steel Tubes Company in Detroit, Mich., and substantial expansion of the capacity of the company's plant are assured in plans lately perfected by the McMillan interests. Although the company sustained a partial loss of its plant by fire in July of last year, temporary reconstruction of the burned section made it possible to keep the works in continuous service and actively employed in the manufacture of steel tubes. The present output ranges from about 400 to 500 tons a month, depending on the size of the tubes manufactured. Arrangements now consummated contemplate extensive reconstruction and enlargement of the plant, with the installation of thoroughly modern equipment. The greater part of the product is used in the automobile industry, although the company is also a large manufacturer of tubes for locomotives and for stationary boilers.

At a recent meeting of the board of directors Philip H. McMillan was re-elected president and Daniel Wells was elected vice-president to fill the position vacated by the resignation of T. H. Simpson. George M. Black was re-elected treasurer and James R. Coulter secretary. The board of directors comprises the above named officers, with T. H. Simpson, Joseph Stringham and James T. McMillan. In becoming identified with the management of the Detroit Seamless Steel Tubes Company, Mr. Wells retains active connection with various lumber and timber interests. R. H. Phillips, who has been associated with the company since 1900, continues as manager.

A New Canadian Traction Engine Plant

The Pioneer Tractor Mfg. Company, builder of gas traction engines, Winona, Minn., announces that the Pioneer Tractor Company, Ltd., has closed a contract with the Minneapolis Steel & Machinery Company, Minneapolis, Minn., for the steel for a plant at Calgary, Canada, where it is expected to start to manufacture a complete line of Pioneer tractors about July 1. The machine shop, which is to be 100 x 600 ft., and the foundry, 80 x 100 ft., will be of brick and steel construction, entirely fireproof. The plant will be equipped with the most modern machinery, and the company is now in the market for this equipment, orders for which will be placed shortly by D. M. Robinson, purchasing agent of the Pioneer Tractor Mfg. Company, Winona, with which company the Pioneer Tractor Company, Ltd., has a joint purchasing agreement.

Pittsburgh and Vicinity Business Notes

The advancing prices of fuel oil do not seem to have caused any abatement in the use of fuel oil furnaces. Tate-Jones & Co., Inc., Pittsburgh, report a continued interest in their tempering and forging furnaces. They have just received orders from the Midvale Steel Company, Ingersoll-Rand Company, American Box Ball Company, Reiff & Nestor, Wyman & Gordon, Kansas City Structural Steel Company, Pittsburgh Steel Company, and others.

The Engineers' Society of Western Pennsylvania has elected S. P. Grace president; R. A. Raymen, vice-president; A. E. Frost, treasurer, and W. E. Snyder and E. H. Haslam, directors.

The Bessemer Gas Engine Company, Grove City, Pa., which recently purchased the business, patents and patterns of the Middleditch Engine Company, Detroit, Mich., is in the market for the following machinery: One plain grinding machine, about 10 in. x 50 in.; one disc grinder, one sensitive drill, one 30-in. vertical boring mill, one small key seating machine, one 18-in. engine lathe, one arbor press. These tools are to be added to the present equipment for the building of small engines.

Chester & Fleming, consulting engineers, are preparing plans and specifications for new pumping machinery for the water works at Jefferson City, Mo., and will take bids on the equipment at their office, 1111 Union Bank Building, Pittsburgh, at an early date.

The Mesta Machine Company, Pittsburgh, is shipping to the Youngstown Sheet & Tube Company, East Youngstown, Ohio, a twin tandem compound reversing blooming mill engine, 46 and 76 x 60 in. This is one of the largest blooming mill engines ever built and has a number of special features.

The Pittsburgh Malleable Iron Company, Pittsburgh, has placed a contract with the Riter-Conley Mfg. Company of the same city for a steel pattern storage building, 40 x 120 ft.

The McClintic-Marshall Construction Company, Pittsburgh, has taken contracts for the steel for a new car shop, 100 x 400 ft., for the Atlas Car & Mfg. Company, Cleveland, Ohio, and also for the installation of a monorail system for the Wolverine Portland Cement Company, Quincy, Mich.

The Carnegie Steel Company will build a large coal dock at Duquesne, Pa., where its Duquesne steel works and blast furnaces are located. This dock will serve as a transfer plant to assemble coal from its mines and divert it to identified interests of the United States Steel Corporation in Cleveland and other districts.

A project for the building of a new open hearth steel plant and sheet and tin plate mills is being pushed by Archibald Smith and others, formerly in the employ of the Allegheny Steel Company, Brackenridge, Pa. The projectors of this enterprise visited Sharon, Pa., last week and held several conferences with the Sharon Board of Trade with a view to locating the plant there. As yet nothing definite in the matter has been done.

Strike at Wire Plants

PITTSBURGH, PA., January 29.—(By Telegraph.)—Serious trouble broke out yesterday between the strikers at the Rankin works of the American Steel & Wire Company and the authorities, one man being killed and 15 others seriously injured. The burgess has declared the borough of Rankin in a state of riot and has ordered all saloons closed. The plant is now under guard and is practically idle. The Braddock works of the company is also seriously crippled. The Rankin works employs 1250 men and more than 1000 of these are out. G. W. Jewett, general manager of the Rankin and Braddock works, has issued a statement in which he says that under no conditions will the company treat with any committee or persons representing the strikers.

The Sidney Tool Company, Sidney, Ohio, recently increased its capital from \$100,000 to \$150,000 in order to take care of the rapid growth of its business, which consists of the manufacturing of a complete line of wood working machine tools.

President of Baldwin Works Speaks

President Alba B. Johnson Gives Interesting Information at Chester Banquet

President Alba B. Johnson, of the Baldwin Locomotive Works, Philadelphia, Pa., was the principal guest at a "Know Your Neighbor" banquet given under the auspices of the Board of Trade of Chester, Pa., January 25. The function brought together many of those identified with the manufacturing industries in that vicinity. A number of the officials of the Baldwin Locomotive Works, both from the Philadelphia and Eddystone plants, were also present. O. B. Dickinson was toastmaster. Mr. Johnson was the principal speaker and made an interesting address, saying in part:

Why the Eddystone Property Was Bought

"The year 1906 found the country at the flood-tide of prosperity, the largest demand for locomotives ever known then existing. The necessity for raw material far exceeded the producing capacity of the Philadelphia works. In order to meet the demand for locomotives, it became necessary to place contracts outside for materials, which should have been made by the works.

"At this juncture the property at Eddystone, which had been purchased by the Gruson Iron Works for a proposed armor plate factory, was offered for sale, and having on it a small foundry it promised immediate relief to the demand for iron castings. This property consisted of 185 acres of land between the Delaware River and the Chester pike, and being crossed by the Pennsylvania and the Philadelphia & Reading railroads was divided into three sections. It also had a frontage on Crum Creek as well as a connection with the Baltimore & Ohio Railroad. Its purchase was completed May 3, 1906, and within one week thereafter the old foundry had been cleaned out and iron castings were being made.

"This property was not purchased for the purpose of removing to it the existing works in Philadelphia. It was purchased to provide immediately the need for raw materials which we were unable to make in Philadelphia, and to provide a place for the future growth of the works. The business conditions then existing forced a programme of construction much more rapid than could have been foreseen. The immediate needs for iron castings caused the construction that same year of a great foundry 900 ft. long and 320 ft. in width. This was soon followed by smith shops, pattern shops, pattern storage houses and a power house.

"The business depression of 1908-1909 forbade further development in those years, but in 1910 a new erecting shop was built, which was enlarged in 1912 to the magnificent shop now there. During all of this time large expenditures have been made for tracks, sewers, grading and general improvements to the property. The number of employees has increased annually. There were 1100 in 1906 and 7000 in 1912.

"Further development of these works will be made as rapidly as the business conditions of the country justify. Plans have been prepared for a modern comprehensive plant, capable of turning out 3000 of the largest locomotives per annum. As the labor of 10 men is required per locomotive per annum, if these plans are realized these works should eventually require a force of 30,000 men. Assuming an average of five persons to a family, this represents a population of more than 150,000 without counting the large additional population necessary to supply the general needs of the community.

The East Chicago Plant

"The great development of manufacturing in the West, and the fact that the center of railroad mileage is probably west of Chicago, have made it advisable to establish a branch of this industry in Chicago. About a year ago a tract of 370 acres was purchased in East Chicago, and it is hoped a development similar to what has occurred at Eddystone will take place there. The cost of transportation of a large locomotive from Philadelphia to Chicago exceeds \$500. A considerable amount of material entering into the construction of locomotives is now manufactured in the West. There is, therefore, a large economy in freight alone, to be effected by a Western plant, which, coupled with economies of manufacture, render inevitable

the development of locomotive building in the West. Plans have been prepared for a locomotive works at East Chicago, consisting of three units, each capable of turning out 10 locomotives per week, so that as soon as the needs of the country justify it there will be developed at that point a plant capable of turning out 30 of the largest locomotives per week.

The Future of the Philadelphia Plant

"The question naturally arises as to the future of the existing works in Philadelphia. Does the development at Eddystone and Chicago indicate their abandonment? I desire to say as strongly as I know how that no abandonment of the plant in Philadelphia is contemplated. That plant is now obsolete for the construction of the largest locomotives. There are not within the works facilities for their erection and, if erected, it would be impossible to get them out over the curves and through the clearances of the Philadelphia & Reading Railroad. The conditions and efficiency of these works for locomotive construction were never as great as at present. They employ a well-disciplined force of more than 12,000 men. They are well adapted to the construction of locomotives up to 100 tons such as are used by the smaller railroads, of industrial locomotives and of locomotives for export. The development of this branch of the business is receiving the utmost consideration, and the intention is to make the strongest possible campaign to secure year by year for the Philadelphia works an increasing proportion of the foreign locomotive business of the world. Important departments of the Philadelphia plant are also devoted to the construction of electric locomotives and electric trucks, both of which are lines of business undergoing rapid development.

"Does the foregoing indicate a bright future for Eddystone and Chester? Let us consider the factors that determine its realization. The Eddystone branch of our works can develop only as fast as the prosperity of the country will justify the investment of the necessary capital. If the attitude of public opinion should continue to be that of hostility and suspicion toward the railroad interests of the country, to demand that they shall continue to pay constantly higher wages to labor, higher prices for commodities, and to give an increasingly higher standard of service, to be forced to accept constant reductions of rates, and to have placed upon them constantly more onerous conditions of operation, then it will be impossible to induce the investors to supply the necessary money for their growth and development, and Chester must share in the results of the retarded development of the whole country. If it should be realized that, next to agriculture, transportation is the largest single industry, and that whatever promotes the prosperity of transportation companies promotes also the prosperity and wealth of the country as a whole, and, if based upon this sympathetic attitude, railroads are allowed to make earnings commensurate with those which are made by capital employed in other investments, then the business future of the country will be bright and Chester will have its share in the large development which may result."

The Newark Foundrymen's Association, Newark, N. J., at its meeting to be held February 4 will see the motion pictures of Rogers, Brown & Co., entitled "From Mine to Molder," which were exhibited in Buffalo at the time of the American Foundrymen's Association convention and elsewhere about the country. The exhibition will be held at the plant of Maher & Flockhart, 76 Polk street, Newark, and will be followed by a buffet luncheon, Scotch music and other entertainment. A. E. Barlow, 28 Orange street, Newark, is secretary of the association. The Rogers-Brown pictures will also be shown February 7 in Sheffield Hall, Yale University, New Haven, Conn., for the instruction of students and also on the following evening for the benefit of Connecticut foundrymen. On February 18 at 8 p. m., they will again be shown in the auditorium of the Engineering Societies Building, New York, for the benefit of local foundrymen and the friends of Rogers, Brown & Co.

The Enterprise Boiler Company, Youngstown, Ohio, has secured a contract for erecting a steel stack 160 ft. high at the plant of the Republic Rubber Company in that city.

The Organization of the Factory*

Two General Classes of Organization and Their Differences

BY JOHN CALDER†

It is well for the young graduate, who sometimes thinks this is a very cold world for the fledgling, to realize fully from the first, that while the engineer designs and constructs his apparatus to accomplish specific mechanical results, the basic motive of all concerned in his work, from purchaser to consumer or user, is personal profit. Though the intellectual character of an engineering task is often of a higher order than some that might be named, and not seldom is greatly esteemed for itself, as a business proposition it is on the same level as any other human service.

The business problem, therefore, in any undertaking is so to limit expenditure that a satisfactory margin of acquisition may be preserved. This requires the most effective teamwork on the part of the individuals who constitute the officers of the enterprise, as well as those who form the rank and file of the industrial army. Organization is the art of so uniting and directing these working forces as to produce the most satisfactory composite result.

The function of the officers in engineering practice is not only to operate plants and various undertakings economically, but also to anticipate business fluctuations, to measure up with care the prospective value and desirability of extensions, to check mere bigness of project and to make reasonable provision for a contracting expense of organization during periods of depression.

The Individual Must Organize His Efforts

Even the individual must organize his efforts if he is to insure success. To attain economic distinction he must first have clearly in his mind what he desires to do. Next he must wisely determine on the method he will use, and lastly he must constantly and persistently prosecute it to the end. If he works on one plan for a time, then changes to another, only to change again and yet again, even to a better plan, he will prosper little.

What is true of individual effort applies even more to the action and reaction of individuals in authority upon one another. With the substitution of the organization for the individual, new difficulties arise. The individual suffers only from his own lack of understanding, of judgment, of energy or decision, but, when more than one person is concerned, there are the added dangers of misunderstanding, of clashing opinions, of diversity of interests, of insubordination and intrigue. Organization cannot wholly prevent these things, but it can greatly encourage or limit them according to its degree of fitness and efficiency.

Question of Centralization of Authority

The question of the centralization of authority is one requiring careful consideration in connection with organization. There are two extremes. If the subordinate officials are wholly unrestricted in their actions, the interest of the industrial organization, or of an engineering or transportation undertaking as a whole, is lost to view and harmony of action becomes impossible. If, on the other hand, all power of initiative is placed in the hands of a central authority, he is so flooded with detail as to cause great delay, and through inability to study varying conditions which arise, general rules are applied to special cases with such rigidity as to cause much loss.

Under such a scheme the emergencies which arise in every undertaking are handled in a feeble, ineffective fashion and a disastrous breakdown of the organization is sure, sooner or later, to occur. The degree to which loss will be incurred is of course conditioned to some extent by the size of the organization, whether it be a railroad system, a large industrial establishment, a group of manufacturing plants or an enterprise of field work engineering.

Divisional and Departmental Organization

There are two main methods of handling the organization problem as a whole, namely, the divisional and departmental plans.

Under the divisional plan single plants and enterprises are given a more or less complete organization under a chief executive officer. The departmental plan, on the contrary, provides an officer in charge of all similar departments wherever situated, with sub-officers reporting to him at each place. In actual practice the divisional plan of organization is never carried out in its completeness. Motives of economy and varying local conditions often do not permit of the theoretically necessary sharp separations of work at different places.

With the departmental plan of organization this difficulty disappears, but others are created. As a rule no one department is sufficient unto itself and some of its work requires the co-operation of other departments. In such a case, when lack of harmony prevails, reference has to be made much further up the line to a common superior than in the divisional organization, and consequently the chance of investigating into and removing the discord is more remote.

The divisional organization tends always to develop a more broadly trained man for the higher positions than the departmental. Such an official (particularly when a young man going through the lower grades of experience) is brought closely in touch with the working of departments other than his own, and usually makes the most of the opportunity. The recommendations and decisions of a divisional officer are therefore likely to have a wider point of view than those of a departmental official.

In actual practice, whether in plants, in engineering corps or in transportation organizations there is no sharp decision made between the two general plans outlined. It is usually a question of opinion and choice as to whether the departmental plan shall end and the divisional shall begin. Sooner or later in the scale of operations similar departments become so numerous and so large that they must have a common authority to refer to in the interests of harmony.

Too Little Stress on Men in Management

The detailed methods of operating an organization within departments and plants cover a wide field, and belong to the subject of System. It may be said here, however, that in a centralized organization the best safeguard against discord in the staff (whatever may be the organization plan) is the external vigilance of the chief officer in control, whose important functions we will proceed to consider.

Before outlining the principles of organization, the question of leadership calls for attention. The trend of much of our present publicity upon the subject of business management is one-sided. It lays too much stress on methods and too little on men. It exhibits too much faith in means and too little in manners. This is largely because so many people without managing responsibilities are now professionally interested in magnifying the mere machinery of business. Both these factors require due consideration, but the human ones should have precedence.

The primary object of organization is to bring brainy men together for work and action. A wise organization seeks and encourages men of ambition. It believes that the ambitious man is not necessarily dangerous. It knows that success demands an aggregation of strong individualities, free to contribute their quota of wisdom, but loyally subordinating their individual preferences to the general policy once declared.

In order that its work may be well done, and its action strong and forcible, the organization must move forward as a harmonious unit. No amount of clever scheming with forms and regulations alone will ever secure this. Herein lies the task and the genius of the leader, the organizer of men as distinguished from the systematizer of things. Both are needed and it is always a happy circumstance when the qualities are combined in one man.

The work of the leader is much easier to talk about than to perform, but the most perfect system of handling routine fails to realize its possibilities when it is not coördinated and intelligently controlled by the official head of the organization.

Relations and Duties of the Staff

Having secured a competent leader for an enterprise and decided upon the general organization plan, we have to consider in the next place the principles on which he will handle the staff which he selects. Two questions at

*From a paper read before the Efficiency Society, New York, January 27, and previously used as the basis of a lecture before the Stevens Institute of Technology, Hoboken, N. J.

†Factory manager Cadillac Motor Car Company, Detroit, Mich.

once present themselves for solution, namely: What is to be the relation of each individual to those about him? and, What are to be the extent and limitations of their duties and authority? On the nature of the answers to these questions depends much of the future success or failure of the enterprise.

Human nature must at all times be kept fully in mind here, for the secret of success is to so arrange the units of authority that they shall act as one person while still contributing fully the knowledge and experience of all.

The principles followed in good organizations are here briefly summarized and illustrated:

1. An executive with deciding powers is provided at all points where action must be taken. Failure to do this opens up the way for vacillation, jealousy, inefficient compromise and disorder. Responsibility divided invites evasion.

2. The responsibility of each position is fully and carefully outlined. A simple chart is often useful in conveying such relations to others and helps to avoid the conflict and lack of coöperation which uncertainty creates.

3. The duties of the various organization positions are made to conform satisfactorily to the ability of those chosen to fill them. This is a most important and often, in reorganization work, a delicate matter with which no influence, or special interest, should be allowed to interfere. Sometimes the occupants must be changed to attain the end desired. At other times it may be necessary to change the organization. Conformity to this condition must, however, be obtained one way or another, and it is the virtue of a reasonable system that it never needs to throw away a good man. Expert engineers are sometimes wholly devoid of executive ability and yet may make excellent advisory members of the staff.

4. No person is made subordinate to two or more others, if it can be avoided, for this is a frequent source of trouble, ill-will and inefficiency.

5. The power to discipline men in any department is allowed to rest in the hands of the official who is held responsible for results. All appeals to the higher motives of subordinates are strengthened, not weakened, when they are made by the authority having the power of reward or of punishment.

6. The duties of the members of the organization are distributed so that unequal loading is avoided. This is necessary in order to make fair comparisons of results. It also keeps the keen worker in the prime of condition and prevents the naturally indolent, though gifted, man from deteriorating.

7. Wherever possible, no positions on the staff are created which are *cul de sacs* for the ambitious and permit of no promotion therefrom. This cannot always be obtained, but unless it is generally secured, even good men lose interest in their work and become inefficient.

Manganese Ore Freight Rates

WASHINGTON, D. C., January 27.—The Interstate Commerce Commission has rendered a decision vacating its suspension order in connection with import rates on manganese ore. To become effective in August last, the Central Railroad Company of New Jersey and other carriers filed with the commission a cancellation of a tariff provision under which manganese ore imported but ground at point of delivery in this country should pay the domestic and not the import rate. Upon protest the commission suspended the proposed change pending its investigation. The import rate to Chicago, among many, is \$3.60 per ton, and the domestic rate is \$5. Cancellation of the provision as approved by the commission has therefore the effect of increasing the rates to the extent of the difference between the import and domestic rates.

Robert Gilchrist & Co., importers and manufacturers of ground ferromanganese, ferrosilicon, and ground manganese at Elizabethport, N. J., protested against the proposed cancellation, but the commission holds that the railroad companies are justified in cancelling the provision allowing import rates on ground manganese ore on the ground that "it operates to grant a privilege that is not accorded to others under similar circumstances and conditions and hence effect undue preference."

W. L. C.

The Efficiency Society Meeting

Plan to Have Medical and Other Schools Instruct in Industrial Hygiene

The Efficiency Society, which held its organizing meeting less than a year ago, celebrated its first annual meeting January 27 and 28 in New York. The five sessions which were held, one a dinner on Monday evening, indicated still a scope of operations very broad and general, but the attitude of the participants pointed toward an early and definite charting of the courses. In fact, a committee of nine was appointed to revise the constitution, and pending its report new officers were not elected. One of the specially noteworthy achievements of the meeting was the unanimous passage of a resolution urging medical and technological schools to provide a course to prepare students for taking up the hygienic problems of industry as a vocation. Finally it may be said that there was a serious and determined atmosphere about the meeting which was calculated to dispel a good deal of the unjust frivolity indulged in nowadays with the mention of the word efficiency. There were inferences of a need to live down the opprobrium which the general movement outside of the society has had to bear.

The resolution referred to was presented by Dr. Winthrop Talbot, chairman of the afternoon session of January 28, given over to a symposium on industrial hygiene with special reference to the prevention of disease among employees. It was as follows:

Whereas, in our population of 92,000,000, 46 per cent., or 42,500,000, now dwell in cities and towns of over 2500 inhabitants, 12,500,000 are engaged in manufactures, trade and transportation, or more than half of the total number of wage earners of the country, and

Whereas, from one-third to one-half of the lives of all wage earners are spent in their places of occupation, generally within doors, and subject not only to industrial accident but also to lowered vitality, illness, disorders and diseases arising in part at least from their conditions of employment, and

Whereas, it is estimated that of all deaths 77 per cent. occur from diseases, half of which are preventable, while but 0.8 per cent. are due to accidents, and

Whereas, there is a growing need for physicians especially trained in industrial hygiene, while few if any medical schools provide instruction in this important branch of preventive medicine;

Therefore be it resolved, that this section of industrial hygiene in session at the annual meeting of the Efficiency Society to consider the topic of prevention of diseases among employees, does hereby direct the chairman, with the approval of the executive committee of the Efficiency Society, to address the accompanying letter to the deans and faculties of all medical and technological schools in the United States, and that copies of it be transmitted to medical journals and the press.

To the Dean and Faculty of.....Medical School:
Gentlemen:

The Efficiency Society, at its sectional meeting on industrial hygiene, January 28, 1913, in New York City, passed the accompanying resolution, to which it respectfully calls your immediate and careful consideration.

In view of the stress properly laid at present upon prevention of accidents and disease, it would seem of the highest importance that in every medical school there should be instituted a thorough course of instruction in industrial hygiene, not only didactic but clinical.

We would draw your attention to the following schematic presentation of some of the more important topics which naturally would be included in such a course.

A Schematic Outline to Present the Possibilities of a Course Upon Industrial Hygiene and the Prevention of Disease Among Workers.

I. Education of the Medical Man; Training of Medical Students for their Responsibilities to Industry and the State. Dr. Talbot's outline, which it is impossible to give in full here, included six subdivisions under this head, each again subdivided, the subdivisions being: 1—Sanitary inspection with required clinical experience; 2—Mechanical and clerical operations in industry, with special reference to their physiological and psychological effects; 3—Accidents; 4—Disease; 5—Fatigue; 6—Industrial legislation.

II. Relation of Employer to Physician.

III. Relation of Physician to Employee.

IV. Relation of Physician to the State and Municipality.

V. Economic and Social Results Already Obtained in the Prevention of Accidents and Disease.

VI. Conditions Conducive to Industrial Health. 1—Work environment; 2—The worker; 3—The work.

VII. Home Environment. 1—Municipal; 2—Private.

Inasmuch as ten millions of our wage earners are engaged in agriculture, in any general course in industrial hygiene, emphasis should be laid upon the special hygienic needs of workers upon farms and the prevention of farm accidents.

This Section would appreciate your acknowledgment of this letter, noting

First—Whether a scheduled course on industrial hygiene is given in your school;

Second—If not, is it probable that action favorable to the institution of such instruction could be undertaken by your school;

Third—The general advisability of instituting a course on industrial hygiene;

Fourth—The outline herewith presented.

Respectfully,
WINTHROP TALBOT, M.D.,

Chairman, Section Industrial Hygiene, Efficiency Society.

Selection of Personnel in an Organization

On Monday morning a session was held on organization. Harrington Emerson contributed a paper dealing in part with the selection of personnel in creating or improving an organization, and this was in part as follows:

Hitherto we have not recognized that individual aptitudes can be predetermined. Predetermination of individual aptitudes enables us to a far greater degree than hitherto to create a reliable organization and to influence favorably and with certainty both management and operation. Individual aptitudes are accurately and minutely predeterminable, much more simply than is known. Determination of aptitudes must always be left to competent and qualified experts.

Let us suppose that the task undertaken by the expert is to select 5000 employees, including executives, for a new organization of any kind whatever, a school, an army, a navy, a labor union, a railroad which suddenly goes into operation, like the subway in New York. There might be 1000 applicants. The four fundamental requirements which a prudent man would not disregard, even in buying a horse are:

- Health or physical soundness.
- Intelligence or mental soundness.
- Honesty or moral soundness.
- Industry or soundness in action.

A very rapid inspection eliminates from the 10,000 about 2500 applicants deficient in one of the four essentials. The proportion, 25 per cent., is large, because thoroughly desirable men are not seeking positions; they are already more or less well placed.

The exclusion of the unemployable leaves a clean, intelligent, reliable, industrious body of men from whom further selections are to be made. Would not nine-tenths of all disasters that overtake industrial plants, whether financial or due to labor difficulties, be impossible if all employees, including executives, were sound, intelligent, honest and industrious? But even in earliest history further and more special subdivisions of qualities were made. The Egyptians, with great rapidity and at a very early date, reached a high degree of civilization, an advance due largely to their skill in organization. They realized the need of three types of men, soldiers, men of the motive type, men who achieved; rulers who guided and enjoyed; priests who studied and counseled.

BLONDES AND BRUNETTES

The positions in any organization fall into motive, vital or mental categories, or into combinations of any two or all three of them in endless variety. But there are other qualities besides those of motivity, vitality and mentality. The great averages of history will, if carefully studied, give some suggestive hints as to difference in characteristics between dark and light skinned peoples. The dark Egyptians rarely went away from home, but they built the most magnificent temples and monuments any people ever produced. The Norsemen and the Danes, both fair races, did nothing worth while at home, but conquered all the coast of Europe and parts of Africa and Asia, not to speak of Iceland, Greenland and visits to America. Are brunettes more conservative and static? Are blondes more unstable and dynamic? While all blondes are not salesmen, are not most salesmen blondes?

We find that the sensitive, delicate minded man has a fine textured skin, that the coarse minded man has a coarse textured skin. We all know that a thin-skinned horse has a highly sensitive, nervous organization, that the thick-skinned horse has no nerves. The skin was and is the original seat of all sensation before there were eyes or ears or smellers or tasters. The skin is still the most sensitive of our organs. We can feel differences of a thousandth of an inch in fitting metal surfaces, differences we cannot possibly see.

The convex face, the one with prominent nose, but receding forehead and receding chin, has opposite characteristics from the concave face in which the forehead and chin are prominent and the central portion receding. Some students have developed marvelous skill in judging character and aptitudes from the hand alone; others develop similar skill by studying handwriting; others judge by the shape of the head; others draw conclusions from the quality of the voice. The man or woman without unusual gift can study the science and become skilled in predetermining characteristics and aptitudes by analysis

and synthesis. Not every one can become an infallible reader of character, but nearly every one can, by study directed by a competent teacher, learn much—learn enough either to avoid in individual action almost incomprehensible mistakes, they are so glaring, or learn enough to be aware of inability to make wise selections and therefore resort to competent counsel given by those who do know.

Scientific Selection and Assignment of Men

Another paper on the same lines as Mr. Emerson's was contributed by Dr. Katherine M. H. Blackford. It was in part as follows:

In industrial plants it is the general rule to leave selection to foremen, many of whom have been chosen for almost any other reason than their real fitness for their positions. In stores, banks and offices the methods of selection are nearly as unscientific, the most common being the old wasteful one of "hiring and firing." The sales manager of a large concern once told me that he tried 300 candidates before he secured an even passably efficient force of 25 salesmen. The cost of engaging, partially training, and finally weeding out the 275 unfit amounted to over \$90,000! This was the actual money loss. The waste of time, energy and opportunity for profitable sales can scarcely be estimated.

METHOD OF SELECTION BY FOREMEN

Analyzing the method of selection by foremen, it is easy to prove it inefficient on several counts.

First, there is a lamentable inefficiency of supply. The foremen do not and cannot take the time or the opportunity to see and select from any adequate number of applicants. They must select from the few who voluntarily apply to them when positions are open. As a general rule, when there are no vacancies, foremen refuse to talk with applicants.

Second, the average foreman does not have time to consider carefully the qualifications of those whom he does see. He has a number of men under his supervision. He is held responsible for a maximum quantity and quality of output.

Third, a foreman is unable to take the time for necessary correspondence in securing men from the outside, even if he has the ability and proper equipment to handle it, which in most cases he has not. He is therefore practically compelled to employ on the principle of "first come, first served," relying upon his power of discharge to eliminate the unfit.

Fourth, even if the foreman could interview all possible applicants, calling them to him from the most likely sources of supply; even if he could give to each one the deliberate consideration required; even if he had the ability and equipment to take care of correspondence, the chances are heavily against his being qualified by nature, knowledge and training to judge accurately of the fitness of men. If he were thus qualified, he would not long continue in the position of foreman.

Man is the result of countless centuries of evolution through inferior forms. His color, form, proportion, bodily texture and mental and moral characteristics are in a sense a summing up of all the results of environment and experience through which he has passed from generation to generation during his evolution. Blondes and brunettes do not work in the same manner. They naturally incline to different lines of work. Generally speaking, blondes are speculative and optimistic; usually mild and good-natured; often inventive; like to conceive the idea or plan for someone else to work out. They naturally incline to aggressive work, such as salesmanship, advertising, and promotion. Brunettes incline to conservatism rather than speculation; often serious-minded; sometimes inclined to gloominess; like to work out and perfect the plan which some other mind has conceived.

Everything about a man indicates his character. In order to understand him we observe, first, his body. Second, we study expression, which reveals itself in language, voice, gesture, handwriting, the eyes, the walk, etc. Expression tells us what the man has done with his inherited qualities, and what habits he has acquired. Third, we must analyze accurately his thoughts and actions, checking them up with his natural aptitudes and acquired habits.

To be a good judge of men requires the judicial mind. One must avoid hasty and illogical judgments, which are

the result of failure to take all the evidence into consideration. Founding a judgment upon size alone or color alone, or, indeed, upon any one indication of character, is to fall into error. Perhaps the most common fault in measuring others is prejudice. This is the result of personal bias. Very few are able to take scientific data and apply it to an individual without being influenced by emotion. Feeling is substituted everywhere and by almost everyone for science. But, difficult as it is, the problem of placing the right man in the right place is being successfully solved for a continuously increasing number of men and women.

The Session of Industrial Hygiene

The symposium on industrial hygiene, held Tuesday afternoon and conducted by Dr. Winthrop Talbot, emphasized the growing field for the medical expert as an employee of the manufacturing organization, and also the need of measures which will give the manufacturer an opportunity to have his employees properly housed and properly fed and thus add to the efficiency of his own organization and consequently to the vital resistance of the employee to incidental or accidental exposure in the manufacturing plant itself. Among those who took part were Dr. S. Irving Clark, of the Norton Company, who described what is being done at the Worcester plant of that company; Frederick L. Hoffman, statistician, Prudential Life Insurance Company; Prof. Charles L. Parsons, chief of the Bureau of Mineral Technology of the United States Bureau of Mines; Dr. George M. Price, medical inspector of the New York State Factory Investigation Commission; Dr. William J. Manning, medical officer of the Government Printing Office, Washington, D. C.; Dr. Thomas Darlington, of the American Iron and Steel Institute; Dr. C. T. Graham Rogers, factory medical inspector of the New York State Department of Labor; Dr. Rosalie Slaughter Morton, New York; Dr. H. M. Clark, of the Crane Company, Bridgeport, Conn.; Prof. C.-E. A. Winslow, of the College of the City of New York; William R. Webster, second vice-president and general superintendent Bridgeport Brass Company, and Dr. Randall Zimmerman, of the Westinghouse Air Brake Company.

It was Dr. Rogers who first asserted that some of the statistics covering industrial diseases should be taken with some caution, on the ground that the diseases are not always wholly due the manufacturing conditions, but that one ought to look after the conditions surrounding the worker in non-working hours. He felt that laws governing the reporting of diseases ought to give the right to investigate the feeding and housing conditions. He emphasized, for example, how even with what might be regarded as thorough washing of the hands, he had found lead on the hands of type and type-metal handlers, so that it would not be difficult to carry the lead to the eating table. Incidentally he mentioned discovering a washing powder which was efficacious in this connection in transforming the lead to a sulphide.

Extended reference was made to the evidences of brass poisoning in brass foundries, the characteristic chill attacking the caster with the onset of winter. Mr. Webster spoke at length on this subject and while he recognized the so-called brass chill as peculiar to the industry, he did not regard it as resulting in a permanent injury, and he said that the caster in many cases becomes immune. Sometimes the single individual suffers a number of attacks, but these usually come with every recurring severe cold snap, when the doors and windows are closed up as tightly as possible. The casters, he said, remained at their work for a longer time than almost any other employee, but of course they held well paid positions. He mentioned a number of cases of employees long in the business who exhibited remarkable resistance with sickness and accident late in life. In his shops no less than 9000 cu. ft. of air per hour are supplied per employee and the shops have high walls and a lofty roof with extensive door and window areas. The workers are of a class who take advantage of the opportunity to make a complete change of clothing and to bathe after the day's work. At one time there was considerable illness and consequent disorganization of work in the heat of summer, but three years ago it was concluded that the trouble arose from the drinking water which, though conceded to be exceptionally pure, is now put through filters and made available through coolers at a better temperature.

At other sessions of the meeting, papers were read by John Calder, factory manager, Cadillac Motor Car Company, on divisional and departmental organization, generous extracts from which may be found elsewhere in this issue and by J. G. Aldrich, vice-president and general manager of the New England Butt Company, describing the use of the motion picture machine for making and analyzing time studies.

To Build By-Product Coking Plants

For the purpose of financing the erection and operation of by-product coke ovens in various parts of the country a syndicate has been formed headed by Ambrose Monell, White, Weld & Co., E. C. Converse, W. E. Corey and others. Construction is to begin this spring on initial plants at St. Louis, Mo., and Bayonne, N. J. At the Bayonne plant, which will be located on Newark Bay, it is planned to coke about 280,000 tons of coal per year, and it is understood that all the salable gas will be purchased by the Public Service Corporation of New Jersey, while other by-products will be marketed by the new company itself. The St. Louis plant will coke about 400,000 tons of coal per year according to present plans. What type or types of oven will be adopted by the company has not been announced, it simply being stated that the company will erect in each locality the ovens best suited to local needs. At the offices of White, Weld & Co., 14 Wall street, New York, it was stated that the new enterprise is to be a manufacturing proposition and that the intent is to sell only to consumers who can use large quantities of the company's products. An influence in the formation of the company was the excellent results obtained with by-product coke oven gas by the Citizens' Gas Company of Indianapolis, Ind.

A Process Working Back from Scrap to Pig Iron

A process for converting steel and wrought iron scrap into pig iron has recently been perfected by Horace W. Lash of the Garrett-Cromwell Engineering Company, Cleveland, Ohio. It is designed for use in the extreme western part of the country where steel making scrap is a drug on the market and low in price and where pig iron for foundry use (there being very little demand for either pig iron or scrap for steel making) commands a considerably higher price than in the East. For producing pig iron under this process the Western Iron Company, in which several prominent Cleveland men are interested, was recently incorporated in Cleveland with capital of \$125,000 and will establish a plant in San Francisco. This company has effected its organization with the election of the following officers: H. W. Lash, president; S. T. Wellman, first vice-president; F. F. Prentiss, second vice-president, and D. R. Taylor, secretary and treasurer. These officers with Dudley Baldwin, S. P. Fenn and W. S. Briggs comprise the board of directors. The company's headquarters are in the office of the secretary and treasurer, Williamson Building, Cleveland. Mr. Lash is at present in San Francisco in the interest of the company.

The Western Conduit Company has remodeled the former Struthers plant of the American Sheet & Tin Plate Company at Struthers, Ohio, which it bought some time ago, and which adjoins the rod and wire department of the Youngstown Sheet & Tube Company. The Western Conduit Company now believes that it has the largest and one of the best equipped conduit plants in the world, making enameled and galvanized rigid conduit, as well as flexible conduit and armored conductors. L. J. Campbell is president; Richard Garlick, vice-president; G. F. Holly, secretary and general manager of sales, and C. C. Rose, treasurer. Mr. Garlick is also treasurer of the Youngstown Sheet & Tube Company, with which the conduit company is identified.

The Standard Iron Company, Deseronto, Ontario, will make a number of improvements to its blast furnace, including relining, a new hearth jacket and the building of a pipe stove. The contract for this work has been placed with Arthur G. McKee, engineer, Cleveland, Ohio.

Halcomb High Grade Steels

The Halcomb Steel Company, Syracuse, N. Y., is distributing two extremely interesting brochures. One is entitled "The Launching of Dreadnought" and the other "Halcomb Electric Furnace Steels."

The first named of these publications treats of the company's high speed steel, now being put on the market under the name of Dreadnought. It is stated that this steel was introduced simply as "special" high speed, and having been tried and perfected for a period of three years a name has been given to it worthy of its extraordinary qualities. The statement is further made that Dr. J. A. Mathews, while assistant manager of the Sanderson Brothers works some years ago, made the important discovery that the efficiency of high speed steels could be doubled, trebled and quadrupled by the use of vanadium, and letters patent were granted him January 3, 1905, covering the use of vanadium in air hardening and high speed steels. Experiments were continued for a time at the Sanderson and the Park works of the Crucible Steel Company of America, and at the latter plant was developed a steel known as Rex-AA, the first vanadium high speed steel made commercially. The Halcomb Steel Company makes high speed steel licensed under the Mathews patent, which is owned by the Crucible Steel Company of America. While the company specifically states that this steel "will not beat every steel every time on every test," there being elements entering into such tests over which it has no control, for uniformity and high average results it will be found unsurpassed.

The second publication treats of electric furnace steels marketed under the brand Halcetralloy. This copyrighted name at once suggests the company, the process and the general type of steel. The Halcomb Steel Company is the pioneer manufacturer in the United States of electric furnace alloy steels, using the Héroult process. The statement is made that in quality the electric steel produced is equal to crucible steel and in many ways superior, besides being a commercial possibility for many uses where crucible steel is out of the question owing to its greater cost. This steel stands more heat in forging than open hearth steel, being in fact almost indestructible in the fire. It also possesses wider safe ranges of hardening temperature, and being cast in ingots of small size its freedom from pipe, seams and segregation makes it economical even at considerably higher first cost.

A thoroughly up-to-date department has been installed for the heat treatment of alloy steels, having five annealing furnaces and seven oil fired furnaces, the temperature of all furnaces being measured by platinum and platinum-rhodium thermo-couples, and also by radiation pyrometers, all of which are calibrated at frequent intervals. The heat treated alloys can be furnished to show any desired physical tests and ready for use without further treatment. A specialty is axle and shaft steel showing 100,000 to 125,000 lb. elastic limit, yet readily machinable. This department can handle anything from the smallest parts up to bars 12 ft. long and 10 to 12 in. in diameter, such as large axles and shafts, hydraulic rams, etc. Chapters are incorporated on nickel steels, chrome-vanadium steels, chrome-nickel steels, silico-manganese steel and chrome-silicon steel.

Changes in Republic Iron & Steel Company

In view of the passing of the holdings of the John W. Gates estate in the Republic Iron & Steel Company into other hands, Charles G. Gates, Oakleigh Thorne and Harry Bronner have resigned as directors of the company. The vacancies have been filled by the election of W. T. Graham, formerly president of the American Can Company; H. L. Rownd, vice-president and treasurer of the Republic Company, and Howard C. Hanna, Cleveland. Mr. Graham has been made a member of the executive committee, which now consists of John A. Topping, Grant B. Schley, L. C. Hanna, E. W. Oglebay, W. T. Graham and James Campbell.

The net surplus of idle freight cars in the United States and Canada on January 15 was 28,439, which compares with 17,058 two weeks earlier. The last net shortage was on December 14 when the demand exceeded the available supply by 34,392.

Sheets for Use in Building

The American Sheet & Tin Plate Company, Frick Building, Pittsburgh, Pa., has issued a second edition of its book entitled "Better Buildings," the previous edition having been in heavy demand from those interested in metal roofing and siding products. The new book is printed on glazed paper, is 6¼ x 9 in. in size and contains 64 pages. It is the work of the American Sheet & Tin Plate Company press, and reflects great credit on that department. A view is given of the Vandergrift-Apollo works of the company, which is referred to as the largest sheet mill in the world, and one of its 35 modern plants making a complete line of high grade sheet and tin mill products. Descriptions and illustrations are embodied of formed roofing and siding products, especially adapted to factory and mill construction, also illustrations of these products suitable for homes, churches and business buildings and of sheet metal garages, grain bins, sheds and shelters. The book impresses on builders the advantages of using steel sheets in various forms for building purposes, special emphasis being laid on the durability of buildings constructed of steel.

Strike at Port Henry Iron Mines

Demands were made the past week by the employees of Witherbee, Sherman & Co., Inc., and the Port Henry Ore Company, operating iron mines at Mineville near Port Henry, N. Y., and a strike followed the refusal of both companies to grant them. Recognition of the union was asked for, a reduction in working hours, and also the reinstatement of two officers of the union who had been discharged for making accusations of cruelty against the companies. These statements were made public at Albany, and the employing companies deny them and call for a full investigation by the State authorities. At the start about half the employees at Mineville were involved in the strike, but a number of men have been returning each day, so that output is now nearly two-thirds normal. Some curtailment of shipments to Eastern furnaces has resulted, but it is expected that the present rate of production will be maintained and gradually increased.

The Kelly Foundry & Machine Company, Goshen, Ind., is annoyed by an erroneous report which has gained circulation to the effect that it had failed. The report evidently originated by confusing that company with the Kelly Foundry Company, Elkhart, Ind., which lately passed into the hands of a receiver. The Kelly Foundry & Machine Company, Goshen, Ind., does not now have and never has had any connection or interest whatever in the Kelly Foundry Company, Elkhart, Ind.

The Treadwell Engineering Company, Easton, Pa., announces that its sales office, covering its line of Stoeber pipe threading, pipe cutting and pipe bending machinery, with other specialties, will be removed February 1 from the works to room 1101, 140 Cedar street, New York City. E. R. Euston, second vice-president of the company, will be in charge of the New York office, where inquiries should be addressed in the future.

The Washington Iron Works, Seattle, Wash., manufacturer of mill, mining and marine machinery, making a specialty of logging and hoisting engines, is installing a 3-ton Girod electric furnace in its new foundry, together with complete equipment for the manufacture of high grade steel castings. This will be the first electric steel casting plant on the Pacific coast.

The purchasing department of the International Motor Company announces that all purchasing for its Saurer factory at Plainfield, N. J., Mack factory at Allentown, Pa., and Hewitt factory at 102 West End avenue, New York, will be done from 1770 Broadway, New York. Latest catalogues and price lists are requested.

The total shipments by the German Steel Works Union in December, 1912, were 532,450 tons, against 492,647 tons in the preceding month and 468,271 tons in December, 1911. Semi-finished material amounted to 173,860 tons, railroad material to 219,980 tons, and structural material to 138,610 tons.

The Machinery Markets

Better demand is widespread in the machinery trade; all marketing centers reporting a gradual but healthy improvement in sales and expressing confidence in what the near future will bring. Sales have picked up a little in New York and the prospects for better business are good. In Philadelphia the total of orders promises to make January a fair month and trade has been promoted by the activity in ship and locomotive building. A greater volume of orders has been received in New England and some builders of metal working machinery have insufficient workmen to promptly meet demand. Inquiries have increased in Cleveland and a satisfactory business is in prospect. While the export trade is slow in Cincinnati, domestic demand is on the increase and a good total for the month is expected. Chicago has had a fair amount of miscellaneous orders and inquiries from the copper country of Michigan are active, but there have been no unusual transactions. Detroit closed a good amount of business in the week and inquiries are plentiful. St. Louis conditions are rather slow in the machinery line, but the trend is not backward. Flood waters still hamper the Central South, but prospects are such as to indicate a maintenance of the average when full activity is resumed. Throughout the Southwest and Texas dealers are well satisfied with present conditions and the outlook, mainly because of the enlargement and new building of public utilities. Birmingham has had an active and miscellaneous demand for machine tools and construction equipment is selling well. The Paymaster General of the Navy Department has issued several lists of machine tools and other requirements, bids on one of which, containing 47 items for delivery in Boston, will be opened February 4. The tools are to equip a floating machine shop.

New York

NEW YORK, January 29, 1913.

While purchasing of machinery and particularly machine tools is not yet in full swing in the New York market there has been some betterment in sales in the last week and the feeling is strong that February will see the closing of some excellent business. To the inquiries already before the trade several more have been added, although the later ones are for one or a few machines only. The Sterling Metal Products Company, Lancaster, Pa., has placed orders against the fair-sized list it issued in December. Orders have just been placed for a number of turret lathes by the American Locomotive Company for delivery at Richmond, Va., the business being divided between three makers. One company could not make delivery in four weeks, as was desired. Salesmen covering Pennsylvania and Eastern territory are looking for the announcement in the near future of requirements for new plants, extensions and replacements which will amount to large figures.

C. H. A. Dissinger & Brother, Inc., machinists and founders, Wrightsville, Pa., will soon be in the market for new machinery. The company was formerly located in Lancaster, Pa., but has been re-established in Wrightsville, and is now in operation. It has made a specialty of gasoline engines.

The Cortland Corundum Wheel Company, Cortland, N. Y., has plans in preparation for contemplated extension of its manufacturing plant which will add 40,000 sq. ft. of floor space. E. B. Pike is president of the company.

The Bernard Glove Company, Johnstown, N. Y., has moved its plant from West State street to a larger factory building on South William street, formerly occupied by Finocan Bros., which is being fitted up for its use.

The Powers Specialty Company, Cumminsville, N. Y., has let a contract for the construction of an erecting shop 100 x 160 ft., adjoining the new molding shop at its plant.

The Dyneto Electric Company, Elbridge, N. Y., which recently increased its capital stock from \$70,000 to \$200,000, has plans under way for the construction of a new plant at Syracuse N. Y. The company also contemplates the establishment of a plant at Detroit, Mich.

Fire destroyed the new factory of the Akron Plaster Board Company on Jackson street, Akron, N. Y., January 22, with a loss of \$15,000. The plant was only recently completed and placed in operation. It will be rebuilt at once.

The West Side Foundry Company, Watervliet, N. Y., is planning to erect a large addition to its plant on a tract of five acres adjoining, which it has recently purchased.

The Morrow Mfg. Company, Elmira, N. Y., A. P. Morrow, president, manufacturer of automobile and bicycle parts and accessories, has plans in progress for a one-story addition to its plant, which will add about 50,000 sq. ft. of floor space.

The American La France Fire Engine Company, Elmira, N. Y., will build a three-story and basement addition 50 x 70 ft. to its plant on East La France street. Architects Pierce & Bickford are now receiving bids. J. R. Clark is president of the company.

The Harrison Mfg. Company, Lockport, N. Y., has filed incorporation papers for the manufacture of iron and steel specialties, with a capital stock of \$200,000. H. C. Harrison, B. V. Covert and W. W. Campbell are among the incorporators. Plans are in preparation for a manufacturing plant.

The Flaxen Fibre Down Company, Lockport, N. Y., J. Sidney Starling, president, which is to move its plant to North Tonawanda, N. Y., is in the market for a 75-hp. steam engine.

The Rochester Brass & Aluminum Company, Rochester, N. Y., is having plans prepared for a foundry and two-story machine shop which it will erect on a site recently purchased on Marietta street.

The Kawild Company, Rochester, N. Y., has let final contracts to the Columbian Concrete Steel Bar Company, 25 East Twenty-sixth street, New York City, for the construction of its factory building 65 x 125 ft., four stories and basement, of brick and reinforced concrete, to cost \$50,000.

The Automatic Transportation Company, Buffalo, N. Y., William C. Carr, president, is planning a two-story addition of brick and stone to be made to its plant at Main street and the Erie Railroad.

The municipality of Ramsey, N. J., will open bids February 4 for a quantity of supplies for its water department, including 100 hydrants, 100 valves and a well pump.

New England

BOSTON, MASS., January 28, 1913.

The improvement in volume of orders experienced by machine tool builders who were late in feeling the revival of demand for metal working machinery continues without abatement. Some of them find themselves unable to care for their trade with present working forces. The wire business is developing the seasonable improvement and the manufacturers are very busy.

The New Britain Machine Company, New Britain, Conn., has purchased from the American Hardware Corporation the screw machine department of the Universal Machine Screw Company, Hartford, Conn. The American Hardware Corporation recently acquired this business. Its own works for the manufacture of screw machine products, those of the Corbin Screw Corporation, were unable to supply the demand, and the Universal Company not only builds multi-spindle automatic screw machines but conducts a large department for the manufacture of screw machine products. The Corbin Screw Corporation wished to produce immediately a large number of the Universal screw machines. Therefore the absorption of the business was wholly logical. The sale of the machine department carries with it a large order for machines, which will supplement the manufacturing capacity of the Hartford factory. The removal of the machine shop equipment to the New Britain Machine Company's works will release space for the screw machine products department. The New Britain Machine Company is building the automatic multi-spindle chucking machines which were acquired with the business of the George G. Prentice Company, New Haven, Conn., and the Universal screw machine is naturally a supplementary line.

The Textile Finishing Machinery Company, Providence, R. I., is planning a large addition to its shops.

The Providence Engineering Works, Providence, R. I., has been reorganized and will resume its old place as a builder of steam engines and manufacturer of contract work for its customers. The personnel of the corporation is a very strong one, and includes James Coulter and Norman Leeds, who are prominent in the management of the Automatic Machine Company, Bridgeport, Conn. In fact, this company will be closely affiliated with the Providence business. Mr. Coulter will divide his time between the two works, giving to the Providence Engineering Works the same mechanical and engineering supervision which constitutes his responsibility at the Bridgeport plant. Associated with him on this side of the management will be the old engineering staff of the company. Richard A. Robertson remains as president of the corporation and will continue his active part in the management. The other officers are as follows: Vice-president, James Coulter; treasurer, Norman Leeds; assistant treasurer and secretary, Frank L. Vaughan. The directors are President Robertson, Vice-President Coulter, Treasurer Leeds and James M. Scott and Randolph T. Ode, Providence; F. J. Kingsbury, Bridgeport, treasurer of the Bridgeport Brass Company, and Richard Irwin and F. Kingsbury Curtis, New York City. The Providence Engineering Works has been since June, 1910, an element in the United States Motor Company and has shared the receivership proceedings. The company has now been discharged from the hands of the receivers and has begun business on the new basis. The plant is a large one, employing 600 men when in full operation. A very large part of its equipment is new and of the finest type. The gear cutting department, for example, is one of the best equipped in the East. The reputation of the Rice-Sargent steam engine is well established and this line will be vigorously pushed. The company will make another specialty of work for outside people. It is a source of much satisfaction not only in Providence, but in New England as a whole, that this old business will continue along the lines upon which it built up an enviable reputation. The house was founded in 1829 as the Thurston & Gardner Company and 30 years later became the Providence Steam Engineering Company, which name continued until 1899, when the business was incorporated under its present name.

The Hercules Powder Company, Wilmington, Del., announces that the plant at Hazardville, Conn., will not resume operations. The works were destroyed by an explosion a fortnight ago. The business was established in the town in 1835.

Word has been received at Ansonia, Conn., that the rivers and harbors bill will contain an appropriation for the survey of the Naugatuck River with the view to the construction of a barge canal from the Housatonic Basin at Derby to Ansonia, which would be the first section of a waterway connecting the important manufacturing city of Waterbury with tide water.

A movement is on foot at Springfield, Mass., to continue the business of the Knox Automobile Company by consolidating it with the Atlas Motor Car Company, the Springfield Metal Body Company and the Brightwood Mfg. Company, all of Springfield.

Announcement is made at New Haven, Conn., that the rolling mill of the New Haven Iron & Steel Company will resume the manufacture of bar iron in the near future. The plant has been closed since June, 1910. The plan calls for the installation of new machinery and boilers.

The Van Dorn & Dutton Company, Cleveland, Ohio, maker of electric drills, reamers and gears, has opened a branch office at 19 Congress street, Boston, Mass. L. W. Woolston is manager of the Boston branch.

Philadelphia

PHILADELPHIA, PA., January 28, 1913.

Several lists covering small groups of tools, which have been under negotiation for some time, have been closed, and a fair volume of scattered single tool orders have been taken. In some lines January will develop into a pretty fair month. The announcement of the Pennsylvania Railroad of proposed large purchases of cars, together with its plans for the electrification of its suburban lines in this vicinity, and its plans for added terminal facilities, is particularly encouraging to the trade. Business continues to come freely to the local locomotive builder, while the shipyards are figuring on the building of a number of vessels. All these activities, it is contended, will lead to heavier equipment buying in the not distant future. Indications point to

a better demand for power equipment. Considerable building work requiring the installation of moderate power plants is being considered. The demand for second-hand equipment, both in power and tool equipment, continues fair. Export trade continues light.

The Martin & W. H. Nixon Paper Company, operating a paper mill on River road in Manayunk, Pa., suffered considerable loss by fire last week. Details as to the extent of the damage have not been given, although it is stated to have been about \$50,000.

Proposals will be received by H. F. Dalton, quartermaster, fiftieth anniversary of the battle of Gettysburg, until February 17, for furnishing a water system at Gettysburg, Pa., which will include tanks and trestles, gasoline engines and pumps, water distribution systems, hydrants, etc. Full information can be obtained on application to the Quartermaster's Department.

The George M. Newhall Engineering Company, Morris Building, has been appointed district sales agent for eastern Pennsylvania, New Jersey, Maryland and Delaware for the line of the valves manufactured by the Rensselaer Valve Company, Troy, N. Y.

It is reported that plans are completed by the Department of Public Works, city of Philadelphia, for the proposed central garage and repair shop for the municipal departments, which will be built by the city in the vicinity of the Spring Garden pumping station. Provisional plans call for a three-story building, the ground floor of which will be used for a garage, with repair shops on the upper floors.

The Joseph Campbell Company, Camden, N. J., has had plans drawn by the William Steele & Sons Company for a fireproof building, 300 x 900 ft., eight stories, to be used for manufacturing purposes.

The P. J. Conroy Brass & Iron Company, Seventy-fifth street and Island road, is contemplating the reoperation of its iron foundry department, which has been idle for some time.

The Schall-Crouch Company, Baltimore, Md., has had plans prepared for a two-story garage, 65 x 85 ft., to be erected at North and Maryland avenues, in that city. Plans call for a heating and lighting apparatus, as well as an elevator. Contract for the construction work will be awarded at an early date.

The Geigertown Electric Light & Improvement Company, Geigers Mills, Pa., has been formed with a capital stock of \$15,000 and proposes to acquire property known as the old Geiger mill, which will be transformed into a hydroelectric power plant. E. M. Zerr is president; J. W. Wolf, secretary, and H. G. McGowan, treasurer.

Puckert & Wunder, engineers, are taking bids on a bottling house to be erected in Atlantic City, N. J., for the Moerlein Brewing Company. The building is to be 93 x 149 ft., one story, heated by steam and equipped with necessary bottling machinery, steel lockers, etc.

The Steel Wheel Company, of Bethlehem, Pa., which will manufacture a spring steel wheel for use on automobiles and motor trucks, will shortly locate a factory on Broad street, Bethlehem, Pa. It will be of three stories with ample floor space for the assembling of machines and the manufacture of wheels. The capital stock of the company is \$100,000, and the officers are J. E. Boatrite, president and general manager; H. W. Sprague, vice-president; F. R. Vanderstucken, treasurer, and I. W. Gangawer, secretary. Address the secretary for information.

Chicago

CHICAGO, ILL., January 28, 1913.

A fair amount of miscellaneous orders are reported as placed and several projects at Chicago are under consideration involving a number of tools. From the copper country of northern Michigan an active inquiry for equipment, including machinery and power apparatus, is noted. The Warren Gas Heater Company, Sheldon, Iowa, is in the market for a number of drills, automatic drilling and tapping machinery and other equipment.

The plant of the Temple Pump Company, at Fifteenth and Canal streets, Chicago, has been purchased by the Chicago, Burlington & Quincy Railroad, and will be dismantled to make way for the new terminals.

The Chicago Interlocking Railway Rail & Joint Truss Company, Chicago, has been incorporated with a capital stock of \$150,000 to manufacture railroad equipment. The company may be addressed in care of Adolph Umenhofer, 1047 Wolfram street.

The Sundberg Company, Chicago, has been incorporated by Jacob A. Sundberg and others. The com-

pany will continue in the manufacture of forgings. The capital stock is \$30,000.

The E. J. Welsh Foundry Company, 2504 North Humboldt street, Chicago, has been organized with a capital stock of \$15,000 by Ambrose Ryan, E. W. Roemer, George B. Williams and W. H. Haight.

The Imperial Brass Mfg. Company, Chicago, has filed notice of an increase in its capital stock from \$100,000 to \$200,000.

The American Car & Foundry Company is taking bids on the steel for its new shops at Madison, Ill.

The Parrott Tractor Company, Ottawa, Ill., has been incorporated with a capital stock of \$25,000 to manufacture and sell farming machinery. The incorporators are D. Parrott, H. T. Parrott and Henry Pollard.

W. H. Hodge, Savona, N. Y., has taken an option on the plant of the Harrison Machine Works, Belleville, Ill., one of the pioneer Illinois concerns engaged in the manufacture of threshing machinery.

The Myers Wholesale Machinery Company, Rockford, Ill., with a capital stock of \$10,000, has been organized by George H. Myers, C. M. Myers and Bert W. Myers, to engage in the machinery business.

The Kankakee Foundry Company, West Kankakee, Ill., has been organized with an authorized capital stock of \$75,000.

The Arcade Mfg. Company, Freeport, Ill., has in contemplation the erection of a large addition to its plant to provide manufacturing facilities for a new line of hardware specialties.

The Little Giant Punch & Shear Company, Sparta, Ill., has been incorporated with a capital stock of \$5,000 to manufacture punching and shearing machinery. The incorporators are Matthew Sproul, T. H. Sproul, C. E. Sproul and William H. Pinkerton.

The plant of the Barnard & Leas Mfg. Company, Moline, Ill., was slightly damaged last week by a fire in the foundry.

The Golden Elevator & Mill Company, Golden, Ill., has been incorporated with \$50,000 capital stock by H. S. and J. J. Emmings and Henry W. Gerdes, with plans for the erection of a mill and grain elevator.

The D. F. Boyer Handle Company, Danville, Ill., has been incorporated with \$50,000 capital stock by D. F. Boyer, George E. Stansbury, E. F. McNulty and J. H. Lewman, and will equip a factory for the manufacture of handles.

The Model Laundry Company, Joliet, Ill., with \$25,000 capital stock, has been incorporated by Charles F. and A. Jensen, Chester H. Johnson and John W. D'Arcy, and will equip a plant.

The Bristol Farmers' Elevator Company, Bristol, Ill., has been incorporated with \$7,000 capital stock by J. F. Windett, J. W. Rider and G. B. Ramond to build and equip an elevator.

The Postal Card Vending Machine Co., Moline, Ill., with \$40,000 capital stock, has been incorporated by C. E. Tourniquist, Cyrus E. Dietz and James M. Johnston to manufacture automatic devices for the vending of post cards.

The Indiana Safety Valve Company, Gary, Ind., has been incorporated with a capital stock of \$50,000 to manufacture safety valves. The incorporators are R. Fitzgerald, V. McGirr and E. J. Zimmer.

The Beloit Iron Works, Beloit, Wis., has just installed at the new plant of the Brunet Falls Mfg. Company the largest paper machine it has thus far built.

The Frost Mfg. Company, Kenosha, Wis., manufacturer of plumbers' supplies, has filed notice of an increase in its capital stock from \$50,000 to \$200,000.

The De Pere Canning Company, De Pere, Wis., has decided to remove to Ripon, Wis., where a new factory will be built. The company recently increased its capital stock from \$20,000 to \$40,000.

The Wrought Washer Company, Milwaukee, Wis., has taken out a building permit providing for an addition to its plant on South Bay street to cost \$25,000.

The Globe Foundry & Machine Company, Sheboygan, Wis., has plans under consideration involving the removal of its present plant to a new plant to be built in another section of the city.

The Sioux City Culvert Company, Sioux City, Iowa, has completed plans and will begin the erection at once of a foundry 60 x 150 ft., two stories.

The George P. Smith Company, Charles City, Iowa, manufacturer of interior finish and general mill work, will build an addition 60 x 150 ft. and two stories. The power plant will also be increased.

Under the name of the Iowa Drop Forge Company, it is planned to reorganize the National Drop Forge Company of Waterloo, Iowa, whose plant was destroyed by fire about a year ago. The new company

will have an authorized capital stock of \$100,000 and will erect a new factory in which suitable machinery will be installed.

Cleveland

CLEVELAND, OHIO, January 28, 1913.

Improvement is observed in the volume of inquiries. Several new inquiries came out in the week for lots of from 4 to 6 tools and a few orders of that size were placed. However, sales were largely in single tools. With inquiries now out and others that are expected shortly there is a very satisfactory amount of business in prospect. Orders are well distributed among various metal working industries. Machinery houses are looking for some good railroad business in this territory in the near future. Second-hand machinery is moving fairly well.

Builders of various lines of heavy special machinery report considerable inquiry. Plants that make railroad track equipment are well filled with orders. The same is generally true of malleable foundries that cater to the railroad trade.

The Detroit, Toledo & Ironton Railroad has issued a preliminary list of machine tool requirements, more definite specifications on which will be sent out later. The machinery will be purchased for its shops in Jackson, Ohio. The list is as follows:

- One 60-in. planing machine.
- One 5-ft. universal radial drilling machine.
- One 20-in. lathe.
- One drill grinder.
- One centering machine.
- One wheel lathe.
- Two boring mills.
- Two turret lathes.
- Two milling machines.
- One 100-ton special crane.

The National Quality Lamp Division of the General Electric Company has an inquiry out for several electrically-driven machine tools for a new plant that is being erected in Cleveland. The list includes:

- Two 24-in. lathes.
- One 32-in. lathe.
- One 16-in. shaping machine.
- Two punch presses.
- One spinning lathe.
- One 2-ft. radial drilling machine.
- One squaring shears.

The city of Cleveland, through the office of the Director of Public Service, will receive bids February 11 for stoker equipment for five 1000-hp. units which will be installed in the new municipal lighting plant. On February 3 bids will be received for condensers for this plant. On the same day bids will be received for a 250-k.v.a. generator for the municipal plant owned by the city of Collinwood. A second-hand generator may be purchased.

The Cleveland Welding & Mfg. Company has moved into its new plant on West 117th street, near Berea road, Cleveland. The company manufactures demountable rims for commercial trucks.

The American Malleable Castings Company, Marion, Ohio, will shortly commence the erection of additions to its plant which will include a molding department 60 x 75 ft. and an addition to the annealing room 60 x 65 ft. This company has recently taken some large railroad orders for malleable castings and the amount of business on its books necessitates enlargement of its plant.

A new industry will be established in Bellefontaine, Ohio, under the name of the Cyclone Feed Cutter Company, which will establish a plant in one of the buildings recently erected in connection with the A. J. Miller carriage body plant. Jesse S. Kauffman will be owner and manager of the plant.

A large plant for the manufacture of women's apparel will be erected at Magnolia and Summit streets, Toledo, Ohio, by the Cohen, Friedlander & Martin Company. A modern, fireproof, reinforced concrete structure providing 150,000 sq. ft. of floor space is planned.

The Samuel Austin & Son Company, contractor, Cleveland, Ohio, has been awarded the contract for a group of manufacturing buildings and a power house to be built in Alberta, Canada, for the Alberta Glass Company. The buildings will be of brick, steel and reinforced concrete construction, one story.

The Galion Brass & Bronze Foundry Company, Galion, Ohio, will shortly place the contract for the erection of its new plant.

The plant of the Findlay Motor Works Company, Findlay, Ohio, has been sold to J. G. Cleary, Milwaukee, Wis. He will dismantle the plant and remove the machinery to Milwaukee.

The Mulholland Hatch Fastener Company, Cleve-

land, has been incorporated with a capital stock of \$10,000 to manufacture hatch fasteners. Joseph J. Klein, E. E. Rodd, George B. Harris and others are the incorporators.

The Buckeye Aluminum Company, Wooster, Ohio, which is enlarging its plant, is in the market for a sheet metal cutting machine, an engine lathe about 30 in. swing, short-bed, a press similar to a Bliss No. 5 inclinable, and an oval double seaming machine.

The Cleveland Farebox Company, of which W. T. Cook is manager, has established a manufacturing plant in a new building recently erected by the City Brass Foundry Company, 5310 St. Clair avenue. The company will manufacture fareboxes for street cars.

Cincinnati

CINCINNATI, OHIO, January 28, 1913.

Machine tool builders nearly all report the export business as being slow at the present time. This is especially true of the European trade, and is attributed to Balkan war trouble. However, domestic orders are increasing, and in spite of the dull period reported in the first part of the month, present indications are that the total business taken on in January will be very satisfactory. A number of shops are operating overtime, and the outlook is fairly satisfactory for the next few months. Skilled labor is scarce.

Electrical equipment of all kinds continues in excellent demand, and it is rumored that local manufacturers will soon be called on to bid on several large plants to be erected in the South this year.

The proposed addition to the plant of the Tool Steel Gear & Pinion Company, Carthage, Ohio, a Cincinnati suburb, recently mentioned, will be approximately 140 x 150 ft., two stories, and of reinforced concrete construction. B. L. Baldwin & Co., Perin Building, Cincinnati, have contract for the construction of the building. The machinery requirements have not been given out.

Stewart & Stewart, Cincinnati, have been selected as architects to draw up plans for the garage and power plant to be erected on Reading road, Cincinnati, by the Kentucky Motor Sales Company, mention of which was recently made. Electrical and power equipment, as well as a few machine tools, will be required.

Work has commenced on the new municipal filtration plant at Portsmouth, Ohio. The Continental Jewell Company, of New York, has contract for the entire work, and is sub-letting part of it to local contractors.

John W. Burk, Springfield, Ohio, is one of the principal incorporators of the Central Automobile Company, that intends erecting a factory at Connersville, Ind., for manufacturing a special six-cylinder touring car. Machinery requirements will not be known until building plans have been perfected.

The Highland Body Mfg. Company, Elmwood place, Cincinnati, has been incorporated with \$81,000 capital stock and will take over the business of the Highland Body Company. Some extensions may be made at an early date. William and James Morrison are named among the incorporators.

B. L. Baldwin & Co., Cincinnati, are ready for bids on the proposed plant of the Ohio Knife Company, Cincinnati, to be erected on a site in Cumminsville.

The Dayton Paper Bottle Company, Dayton, Ohio, has tentative plans under way for the erection of large addition to its plant. C. V. Crist is president of the company.

The Columbus Iron & Steel Company, Columbus, Ohio, has increased its capital stock from \$1,000,000 to \$1,500,000.

The Hamilton-Otto Coke Company, Hamilton, Ohio, has been incorporated with \$700,000 capital stock by J. C. Thoms, E. M. Peters, E. C. Slemmer and others. The new company will conduct the business of a company heretofore operating under the same name.

The Babcock & Wilcox Company's Cincinnati office was the successful bidder for a large boiler to be installed in the Springfield Light & Heating Company's plant at Springfield, Ohio.

The Ferro Concrete Construction Company, Cincinnati, has obtained contract for the erection of a large shoe factory addition at Portsmouth, Ohio, for the Irving Drew Shoe Company, whose plans were recently mentioned. Considerable power transmission and other equipment will be needed.

W. H. Riker, 27 Baker street, Cincinnati, is in the market for a small lot of woodworking machinery equipment.

Among recent outside contracts awarded the Ferro Concrete Construction Company, Cincinnati, is a large

addition to the plant of the Morgan & Wright Company, tire manufacturer, Detroit, Mich., and a warehouse and boiler room for the Beechnut Packing Company, Rochester, N. Y.

The Franklin Plumbing & Heating Company, Hartwell, Ohio, a Cincinnati suburb, is in the market for a quantity of high pressure steam fittings for use in the new addition to the power plant of the Philip Carey Mfg. Company, previously reported. In the list of equipment already purchased are two 500-h.p. Stirling water tube boilers and one 260-h.p. Babcock & Wilcox boiler.

Geerin Bros. & Co., Cincinnati, have secured contract for the heating and ventilating system to be installed in the proposed twelve-story hotel building now being erected for the Gibson House Company.

The Hermes Motor Car Company, Cincinnati, whose incorporation was reported some time ago, has secured a location for a plant in Cumminsville suburb. Only a few light electrical tools will be bought just now.

Preliminary plans are in progress for a one-story brick factory building, 100 x 500 ft., to be erected at Evansville, Ind., for the Hercules Buggy Company. Equipment for manufacturing gas and gasoline engines will be required. W. H. McCurdy is president of the company.

The city of Willoughby, Ohio, will open bids February 22 for a mechanical water purification plant, 1,000,000 gal. capacity.

The city of New Berlin, Ohio, will open bids February 4 for the construction of sanitary sewers and sewage disposal plant.

The Standard Ultramarine Company, Tiffin, Ohio, has awarded contracts for the erection of a factory building at Huntington, W. Va., estimated to cost \$100,000. The company will manufacture ultramarine, a pigment which is used for a variety of purposes.

Detroit

DETROIT, MICH., January 28, 1913.

The machinery trade has exhibited increased activity the past week and a really good volume of business was transacted. The amount of miscellaneous inquiry before the trade is considerable, and a pleasing feature of a good deal of this prospective business is that it promises to close easily and result in actual orders within a reasonable time. A great deal of interest is being manifested in machinery circles in the local automobile show, as it has been found that considerable business results indirectly from these exhibitions. The local market for second-hand machinery is reported as rather narrow. Little that is new is reported in special lines, although the demand for electrical equipment continues quite active. Activity in machinery circles in the upstate manufacturing cities is quite marked, reports of healthy conditions being noted from Grand Rapids, Kalamazoo and Saginaw. New factory construction work is being reported in considerable quantity and contractors are looking forward to another record year in this line.

The Detroit Insulated Wire Company, Detroit, has acquired a tract of 12½ acres, adjoining its present plant, and has commenced the construction of two large factory buildings. The site was already improved with a large office building and storage sheds. The company is a large manufacturer of rubber covered wire and cable and the rapid increase of its business made necessary the expansion of the plant.

The Detroit Coil Company, Detroit, has been incorporated with a capital stock of \$10,000 to manufacture spark and ignition coils. The incorporators are Carl C. and Joseph R. Cleverdon and John F. Strobbe.

The White Star Refining Company, Detroit, has taken out a building permit covering the erection of a one and two story brick factory building 50 x 115 ft., to cost about \$10,000.

The Industrial Mfg. Company, Detroit, has been incorporated with \$3,000 capital stock to manufacture electrical devices.

Albert Paschke, 436 Mack avenue, Detroit, has taken out a permit for the erection of a two-story brick factory building 60 x 80 ft., at Bellevue and Ferry avenues.

The Detroit Trailer Company, Detroit, has been incorporated by Stanley R. Du Brie, William H. Turner and A. C. Turner, with a capital stock of \$5,000. The company will manufacture automobile trailers and accessories.

The plant of the Grabowsky Power Wagon Company, Detroit, consisting of a number of buildings which occupy a site of 8½ acres, has been sold to Howard B. Bloomer, of this city, at receivers' sale.

The purchaser is not prepared to state, at this time, what disposition will be made of the property.

The National Gear Company, Detroit, has been incorporated with \$1,000 capital stock to manufacture machinery gears and other machine parts. The incorporators are Thomas J. Hoyt, George H. Klein and Ralph B. Leacy.

The Wayne Cigar Company, Detroit, has acquired a large building at Forest and St. Aubin avenues, and will equip it for the manufacture of cigars and tobacco.

The Electric Furnace Sales Company, Detroit, has been incorporated with \$1,000 capital stock to manufacture and deal in electric furnaces. Edwin L. Crosby is the principal stockholder.

W. K. Prudden & Co., Lansing, Mich., manufacturers of automobile wheels, has filed notice of an increase of capital stock from \$500,000 to \$750,000.

The Marinette & Menominee Box Company, Menominee, Mich., has decided to engage in the manufacture of its own box lumber and will erect and equip a large plant for this purpose.

Nicholas & Sheperd, Battle Creek, Mich., are having plans prepared for a one-story foundry 22 x 205 ft., the cost of which is estimated at \$35,000.

The Linde Air Products Company, Buffalo, N. Y., will at once begin the construction of its No. 6 plant at Detroit, Mich., the contract for its erection having been awarded to the Theodore Starrett Company. It will be 110 x 132 ft., one story, of brick construction, and involves an investment of about \$500,000. Preliminary work is also complete for the establishment of a number of additional plants, all of which it intends to put in operation this year.

The International Wire Fence Machine Company, Battle Creek, Mich., has been incorporated with a capital stock of \$50,000 to manufacture a new type of automatic machine for making wire fencing. The officers of the company are: President, J. S. Blair; vice-president and general manager, H. H. Hunter, and secretary and treasurer, C. C. Miller. The board of directors will consist of these officers, together with George A. Rayomond, H. H. Batdorf, F. Z. Robbins and J. L. Hooper.

Indianapolis

INDIANAPOLIS, IND., January 28, 1913.

In harmony with its profit-sharing plan, the Indianapolis Brass Company has distributed \$1,000 to 20 of its employees, representing part of the net earnings for 1912. The individual amounts ranged from \$16 to \$62, based on the wage earnings. Enclosed with the checks was a letter which read, in part: "This money is not a gift or a bonus. It represents something which you have earned and which was not counted in your wages. By making your work count for economy of time and material and efficiency of labor you have 'cut the corners' and made a profit for the business." The company says the plan has given the employees the kind of spirit a stockholder has in working for the interest of the company. M. W. Kelly is president of the company; James H. Drew, secretary, and T. A. Lavelle, general manager.

The Warrick Anchor Company, Indianapolis, has been incorporated with \$25,000 capital stock to manufacture earth anchors. The directors are Horace G. Brumfield, Franklin W. Davidson and Charles M. Rich.

The McCray Mfg. Company has been incorporated in this city with \$50,000 capital stock to manufacture machinery. The directors are John E. McCray, Aaron A. McCray and W. W. Spencer.

Maurice J. Scanlan, of Indianapolis, is organizing a company to build a stone crushing plant at the H. C. Adams stone quarries near St. Paul, Ind.

Edward W. Pierson has been appointed receiver for the Indianapolis Dash Company, bond being fixed at \$25,000.

The Banner Furniture Company, Muncie, Ind., has increased its capital stock from \$100,000 to \$200,000.

The American Art Company, Anderson, Ind., has been incorporated with \$10,000 capital stock to manufacture novelties. The directors are Thomas Hans, A. C. Hans and M. Spray.

The People's Power & Light Company, Alexandria, Ind., has taken over the holdings of the Central Indiana Lighting Company here. The new company is incorporated with \$500,000 capital stock.

The Ideal Husker Company, Rushville, Ind., recently incorporated with \$400,000 capital stock, has elected A. P. Walker, Rushville, president; C. B. Smith, St. Louis, vice-president; L. G. Vannice, Rushville, secretary, and M. E. Newhouse, Rushville, treasurer and manager. The husker is the invention of Mr. Newhouse and Charles Younger.

The Commercial Club, of Newcastle, Ind., has entered into a contract with the Farm Tractor Company, of Indianapolis, to build its plant at Newcastle. It will manufacture gasoline-propelled plows. T. B. Funk, Indianapolis, is president of the company; J. C. Keppeler, Indianapolis, secretary-treasurer.

The Evansville Manufacturers' Association, Evansville, Ind., has elected H. C. Kleymeyer president and Henry J. Karges vice-president.

The Central Car Company, Connersville, Ind., has been incorporated with \$100,000 capital stock to manufacture motor-driven and other vehicles. The directors are Joseph E. Huston, John W. Burk and R. T. Huston.

The Rutenber Electric Company, manufacturer of electric stoves and iron, will move from Logansport to Monticello, Ind.

Richmond, Ind., will spend \$70,000 improving the municipal electric light and power plant.

The Schaff Brothers Company, Huntington, Ind., has been incorporated with \$50,000 capital stock to manufacture pianos.

The Hoosier Specialty Company, Lafayette, Ind., has been incorporated with \$10,000 capital stock to manufacture novelties, etc. The directors are Harry W. Brissender, George W. Anderson and John M. Stanley.

The Plast Post Company, Marion, Ind., has been incorporated with \$8,000 capital stock to manufacture fence and other metal posts. The directors are Philip Matter, Isaac Plast and Earl Newhouse.

Daniel McClaren, Cincinnati, has been named receiver of the Columbus Buggy Company, Columbus, Ind. The suit is said by Valentine & Co., New York, the petitioners, to be a friendly one, with a view of providing more ready capital. The assets are given at more than \$1,000,000; liabilities, \$600,000.

The City Council of West Terre Haute, Ind., has granted a 50-year franchise to a local company for a waterworks system. It has been incorporated as the West Terre Haute Water Company. The directors are J. W. Ratcliffe, J. C. Kelly and R. P. Niece.

The new plant planned for the Shoals Furniture Company, Shoals, Ind., will use oil engines and the machines will be operated by direct-connected motors. The plant will also supply light and power in the town.

The Johnson Brothers Motor Company, Terre Haute, Ind., has been incorporated with \$70,000 capital stock to manufacture motors and accessories. The directors are Louis J. Julius and Harry Johnson. The Commercial Club will provide the company with a factory for the manufacture of aeroplane and motor boat engines and monoplanes. The Johnsons have invented a number of parts of engines and heavier-than-air fliers.

The Howard Motor Car Company has been incorporated at Connersville, Ind., with \$10,000 capital stock to manufacture automobiles and accessories. The directors are Guilford C. Babcock, Harry Tuttle and Clarence L. Millard.

The Central South

LOUISVILLE, KY., January 28, 1913.

In spite of the fact that the flood waters of the Ohio River and its tributaries had begun falling over a week ago, the situation is still far from normal, as rains have been of such volume as to make it impossible for the high waters to subside entirely. Consequently general interruption to business continues. One machinery house which sells throughout the Central South has 1300 miles of rivers in its territory, and reports that practically all of these streams are out of their banks, the result being that little has been accomplished. Nevertheless, it is generally agreed that prospects are excellent, and that as soon as machinery men are given a chance to get busy they will restore the volume of business to satisfactory proportions. There is good inquiry for power equipment of all kinds, while wood-working and ice machinery are also in fair call.

The Champion Wire & Iron Works, Louisville, has been incorporated with \$10,000 capital stock. This is a going concern, those interested being J. H. Shrader, A. T. Kochenrath and J. Shrader. The company has completed the erection of an addition to its plant. Some new machinery has already been installed, while it is stated that further purchases are to be made. The company manufactures ornamental iron work of all kinds.

Maxwell S. Barker, Louisville manager of the Barrett Mfg. Company, reports that the damage to the plant of the company by fire last week was overestimated. No additional machinery will be needed.

The Bowling Green Quarries Company, Bowling Green, Ky., has increased its capital stock from \$50,000 to \$150,000, and will install additional equipment.

enlarging the output of its limestone quarries considerably. Samuel Pickels is secretary and manager.

The convention of the National Canning Machinery and Supplies Association is being held in Louisville this week in connection with the annual meeting of the National Canners' Association. A great deal of special equipment used in the industry has been on display in the First Regiment Armory.

The Council of Vine Grove, Ky., has contracted with W. A. Burkhart to install a lighting plant of moderate capacity. The equipment will be purchased by Mr. Burkhart in the immediate future.

The power-house of the United Water, Light & Traction Company, Somerset, Ky., will contain a new boiler and 500-kw. turbo-generator, it is announced. Plans are being drawn by Sargent & Lundy, Chicago. The Somerset property is owned by the Insull interests of Chicago.

The Schenck Machine Company, Pittsburgh, is to locate in Newport, Ky., according to announcement from the Business Men's Club of that city. Its factory will be on Orchard street.

The Coca-Cola Bottling Company, Fulton, Ky., has announced that equipment for a complete bottling plant will be purchased for use in that city in the immediate future.

B. H. Alvey, Elizabethtown, Ky., has patented a new type of rotary engine which he plans to manufacture. Arrangements for its production will be completed shortly.

The Kentucky Utilities Company, which has control of a number of public service properties in this state, is reported to be planning the improvement of its plant at Elizabethtown. Address the manager in charge of the plant.

The handle factory of H. R. Lemay, Corydon, Ind., was burned January 22, the loss being \$5,000. Plans for rebuilding, involving the purchase of power and woodworking machinery, are now under consideration.

Carr Bros., Nashville, Tenn., have purchased 10,000 acres of poplar and oak timber in Knox and Bell counties, Ky., from the Continental Coal Corporation, Pineville, Ky., and will install a large sawmill near Pineville.

Yerkes & Pritchard, Paris, Ky., are completing the purchase of equipment for a new automobile repair shop which they have established in that city.

The Bloomfield Roller Mills, Bloomfield, Ky., will purchase additional power equipment at a cost of about \$2,500. A boiler and an engine will be needed.

The Kentucky Jewel Coal Company, Hazard, Ky., has begun the purchase of machinery for its new coal mining operation in Perry County, one of the newest of the Eastern Kentucky coal fields. The capacity of the plant will be 800 tons a day.

F. L. Estes & Co., Nashville, Tenn., manufacturer of small mill and woodworking machinery, have amended their charter whereby their capital stock is increased from \$9,000 to \$15,000. The increase is due to expanding business. Additional machinery will be needed. F. L. Estes is manager of the plant, which is located at 331 Fourth avenue, South.

The Sunbright Canning Company, Dickson, Tenn., the plant of which was burned several weeks ago, has announced that the factory will be rebuilt in time to operate during the coming season. James Wyley is manager.

The Merchants' Ice & Cold Storage Company, Memphis, Tenn., will build an ice factory and refrigerating plant in that city. A four-acre site has been secured. W. W. Johnson is in charge of machinery purchases.

The Sevierville Light & Power Company, Sevierville, Tenn., is to purchase a 50-k.v.a., 60-cycle generator, with exciter and switchboard, as well as four 15-kw. transformers. Address Clyde McMahan.

The city of Dunlap, Tenn., is considering the erection of an electric light plant.

The Commissioners of Memphis, Tenn., have received a proposition relative to the erection of an electric light and power plant here. George H. Alban is one of those interested in the project.

The Smith Drill & Machinery Company, Chattanooga, Tenn., recently incorporated, has taken over the plant of the Smith Drill & Machine Company. G. W. Smith is manager of the concern.

The White-Starr Iron Works, Chattanooga, Tenn., has taken over the plant of William White & Sons at 421 Elm street. A general foundry jobbing business is carried on. H. A. Starr is president.

Lamon Bros., Cleveland, Tenn., are in the market for woodworking equipment for use in a wagon and carriage repair shop.

The Thornhill Wagon Company, Lynchburg, Va., is reported to be in the market for equipment for a

150-h.p. power plant, boilers, engine, generator and other units being required.

The Cameron Stove Company, Richmond, Va., is in the market for cupolas and other foundry equipment. R. B. Cardoza is in charge of the purchase.

J. F. Elder, Columbus, Miss., is in the market for cupolas, blowers and other foundry equipment. Used machinery will be considered.

The Planters' Oil Mill & Gin Company, Kosciusko, Miss., is in the market for machine shop equipment, including a shaper, lathe, etc.

The city of Lafayette, La., is to install additional equipment for its electric light and water plants. Boilers, an electric generator and an air compressing outfit will be needed.

The city of Waveland, Miss., will probably build an electric light plant, tentative plans looking to carrying out the project having been formed. The mayor has details.

The White Swan Laundry Company, McGehee, Ark., is to install boilers and electric light equipment in a new plant which is being erected at a cost of about \$10,000.

The Interwoven Mills, Martinsburg, W. Va., is reported to be considering the erection of a large addition to its textile plant. It manufactures knit goods.

The Portsmouth Planing Mills, Portsmouth, Va., is in the market for a 75-h.p. return tubular boiler. A used boiler will be given the preference. Frank C. Lewis is president.

Birmingham

BIRMINGHAM, ALA., January 28, 1913.

There is an active demand for machine tools. This business is especially good with garages and factories. Inquiries for saw-mill supplies is steady with a fair volume of business. The demand for various kinds of machinery and machine tools from the large contractors is continuous. There has been no change in the satisfactory status of the latter portion of 1912 and the beginning of 1913.

A. H. Ford, president of the Birmingham Railway, Light & Power Company, Birmingham, reports the probable location of a plant by a large gas stove manufacturing company of Ohio.

H. B. Foster and others have obtained a franchise in Tuscaloosa, Ala., and propose to commence at once the building of a \$75,000 gas plant to be in operation by July 1.

The Watauga Power Company, owner of the new hydroelectric plant on Watauga River, near Elizabethtown, Tenn., has sold a bond issue of \$400,000, of which \$300,000 represents cost of the dam, the remainder to be used for contemplated improvements.

It is announced by the Atlantic & Gulf Portland Cement Company, Ragland, Ala., that \$75,000 will be spent for enlarging the plant to 600 barrels a day capacity. The receivership of the company is expected to end in a short time.

The city of Gadsden, Ala., has offered a bonus of \$3,000 to the Hammond-Byrd Pipe Company, Birmingham, Ala., to build a soil pipe plant. Negotiations have not reached conclusion.

The William F. Donovan Provision Company, Birmingham, with a capital stock of \$150,000, has been incorporated to erect and operate a meat packing plant. F. W. Blackford is vice-president.

The Lucas F. Moore Stave Company, of New York and New Orleans, will build a mill at Mobile, Ala.

The Key West Box Company, Key West, Fla., will increase its capacity 50 per cent., or to 4500 boxes per day.

The Meaders-Rogers Mfg. Company, Atlanta, Ga., has been incorporated with a capital stock of \$6,000 by A. J. Stewart, D. J. and J. C. Meaders and L. W. Rogers. It will manufacture furniture.

J. E. Davidson, of Norfolk, Va., is contemplating the establishment of a packing box factory.

The Birmingham Water Works Company will add eight filtration tubs to battery of 30 now in operation, each tub to have daily filtration capacity of 500,000 gal.

The Dudley Cotton Mill Company, Granite Falls, N. C., will construct a hydroelectric plant on Little River to supply cotton mills.

The North State Power Company, Morganton, N. C., will construct a hydroelectric plant on the Catawba River near Morganton.

George H. Davis and associates will erect syrup refinery at Live Oak, Fla.

The Hall Turpentine & Investment Company, Ocala, Fla., has been incorporated with a capital stock of \$50,000. R. S. Hall, president.

The National Logging & Lumber Company, Atlanta, Ga., with a capital stock of \$200,000, has been incorporated by J. L. Anderson, George P. Whitman and Frederick Kauffman.

W. E. Aycock, of Moultrie, Ga., and Irwin W. Myers, of Tifton, will incorporate the Swift Lumber Company and build a mill with a daily capacity of 40,000 ft. and a four-mile tram road on a 2,000-acre tract in Thomas County.

The Florida Ice & Coal Company, Jacksonville, Fla., will install additional equipment, including two gas compression pumps, vacuum ammonia gauges, etc. Contract calling for \$44,000 expenditure has been awarded.

The National Cast Iron Pipe Company, Birmingham, will close a contract for foundry building at early date.

The Dixie Fertilizer Company, Prattville, Ala., has been incorporated by Daniel Pratt, C. E. Thomas, W. A. Gayle and others. It will build a fertilizer plant.

The Arcadia Electric Light & Telephone Company, Arcadia, Fla., will enlarge plant and install machinery.

The Burra Mining Company, Ducktown, Tenn., will build an addition to its power plant, install boilers and electric generators, etc.

The Tampa Packing Company, Tampa, Fla., recently incorporated, will erect a plant costing \$25,000 and install \$10,000 worth of machinery. H. T. Lykes is president.

St. Louis

St. Louis, Mo., January 27, 1913.

Though the improvement is rather slow, nevertheless, the machine tool market at this point is showing no backward tendency and the business is reasonably fair for the period, all things considered. The inquiries are not as numerous as the dealers would like to have them, but there appears to be nothing in the general situation to discourage them seriously.

The H. R. Wilson Machinery Company has been organized, with offices in the new Bank of Commerce Building, Broadway and Pine streets, St. Louis, to conduct a general business in second-hand electric and steam machinery.

The Illinois Power Company, East St. Louis, Ill., has been incorporated with a capital stock of \$100,000 to manufacture and distribute gas and electricity. The organizers of the company include Julian Laughlin, Philip Rohan and Herbert Charters.

The National Sheet Metal Mfg. Company, St. Louis, has been organized with a capital stock of \$5,000 by George F. Carragher and Louis J. Powers. The company will manufacture sheet metal products.

A brick plant to cost, with equipment, about \$35,000 has been proposed to the Commercial League at Carthage, Mo., by C. E. McClusky and C. S. Bahnney, of St. Joseph, Mo., who proposed to build if given suitable local support.

The Eagle Liquid Soap Company, St. Louis, has been incorporated with \$50,000 capital stock by Julius G. and Henry Winkelmeyer, J. C. Bulls and R. J. Hyatt to equip a plant for the manufacture of liquid soap.

The Mutual Brewing Company, St. Louis, of which L. F. Padberg is president, has voted formally to increase its capital stock from \$700,000 to \$800,000 to complete the enlarged plant which will be in full operation by June at the latest.

The city of Drexel, Mo., has plans for the construction of a waterworks plant, under the direction of the mayor and other officials. The city will also vote on a bond issue of \$40,000 for the purpose.

The water plant at Maryville, Mo., will be enlarged and extended by the city, which recently purchased it, and about \$30,000 will be spent on the work.

The Clark-Gay Mfg. Company has plans for the reconstruction of its wagon hub manufacturing plant at Little Rock, Ark., recently burned with a loss of \$75,000.

The Roderick Buggy & Implement Company, Hannibal, Mo., has been incorporated with \$25,000 capital stock by S. F. Roderick, H. S. Elzea and F. M. Head to equip a manufacturing plant.

Henry C. Hartenbach, St. Louis, has bought a site for the construction of a plant for the mechanical cleaning of carpets, etc., and will install in the building to be erected about \$25,000 worth of mechanical equipment.

The City Steam Laundry Company, Kansas City, with \$8,000 capital stock, has been incorporated by Herman C. and A. Adler, Charles R. Baldwin and Jesse Conroy and will equip a plant at once.

The St. Elmo Quarry Company, Springfield, Mo., with \$50,000 capital stock, has been incorporated by C. A. Harfield, C. F. Hunt and L. E. Hunt and will equip quarry property with machinery, it is announced.

The St. Louis Vinegar Company, St. Louis, Mo., with \$25,000 capital stock, has been incorporated by F. O. Cushing, L. O. Cushing and others and will equip a plant for the manufacture of vinegar and grocers' sundries.

The Deep Fork Coal Company, Henryetta, Okla., recently reported incorporated by J. H. Savage, J. H. Kellogg and others, has plans for the equipment and development of 300 acres of coal land, raising about 400 tons per day.

The Farmers' Independent Gin Company, Kanawa, Okla., with \$10,000 capital stock, has been incorporated by G. W. Cummings, W. C. Davis, J. M. Phillips and others and will build a ginning plant.

The Farmers' Cotton Oil Company, Mangum, Okla., W. W. Harris, president, has plans for the construction of a mill of 80 tons daily capacity in time for the 1913 cotton seed crush.

A power plant for an electric street railroad in Argenta, Ark., has been decided upon by J. W. Carpenter, of Corsicana, Tex., who has a 50-year franchise.

The Pocahontas Light, Power & Ice Company, Pocahontas, Ark., with \$25,000 capital stock, has been incorporated by W. H. Skinner, Ben A. Brown and S. A. D. Eaton and will equip a combined plant shortly.

The improvements in the Rich Hill, Mo., electric plant, recently noted, will include boilers, engines and heaters, and the expenditure will be about \$15,000, under the direction of Rollins & Westover, of Kansas City.

An electric light plant is to be constructed at Stone-wall, Okla., by the city, and the contract will be handled by Donald A. Tolbert, Ada, Okla.

The Westbrook Grain & Commission Company has decided upon the construction of large mill and elevator at Pine Bluff, Ark., at a total cost of \$40,000 for equipment, Kaucher, Hodges & Co., of Memphis, Tenn., being the general contractors.

The Roush-White Company, Stuttgart, Ark., with \$25,000 capital stock, has been incorporated to manufacture and deal in machinery by H. F. Roush, S. White and O. M. Young.

The Gulf Gas Company, Biloxi, Miss., with \$1,000,000 capital stock, is to be incorporated by C. B. Kinney, of Biloxi; John T. Schley, C. D. Willoughby and A. L. Staples, of Mobile, Ala.

The Elk City Ice, Fuel & Light Company, with \$60,000 capital stock, has been incorporated at Elk City, Okla., by W. T. Havard, A. E. Fritsch and D. M. Brenneman, all of Hobart, Okla., to equip a combined plant.

Joseph N. Ward, of Fort Smith, Ark., who has bought the Stigler Light & Ice Company's plant at Stigler, Okla., will rebuild and practically re-equip it, it is reported.

The Englewood Mfg. Company, Englewood, Tenn., with \$50,000 capital stock, has been incorporated by J. M. Wilson, L. A. Copenhaver and R. H. Hicks and will equip a mill for the manufacture of knit goods.

The Tennessee Hoop Company, Memphis, Tenn., has increased its capital stock from \$25,000 to \$100,000 and will enlarge its plant. It plans to provide for the manufacture of heading, hoops and staves generally as well as the manufacture of elm coil hoops.

The Louisiana Pulp & Paper Company, with \$150,000 capital stock, has been incorporated to rebuild and operate the Braithwaite, La., paper mill, with an expenditure of about \$100,000 immediately and more to follow. Charles F. Hubbs is president, and the company has offices in the Whitney-Central Building in New Orleans.

The Empire Stave Company, Black Rock, Ark., has had plans prepared and will soon begin the erection of a factory for the manufacture of hardwood staves. J. H. Crites, Black Rock, manager, will soon receive bids for equipment.

Texas

AUSTIN, TEXAS, January 25, 1913.

Industrial conditions throughout the Southwest continue active and dealers in machinery and tools are well satisfied with the situation. Special attention is being given to the establishment of new public utilities in the different towns and cities and the enlargement of existing systems, particularly waterworks, sewers and electric lighting plants.

Swift & Co. of Chicago will establish a cold storage plant at Corpus Christi.

The Cost Oil Company has been organized for the purpose of boring oil wells near Gonzales. The incorporators are F. D. Kokernot, W. L. Gardien and R. S. Chambers.

The Consumers Ice & Cold Storage Company has

been organized at Brownsville with a capital stock of \$30,000. The incorporators are G. P. Durham, V. L. Criswell and L. B. Puente.

Plans are on foot for the construction of a sewer system at Eagle Lake.

Charles P. Taft, Cincinnati, Ohio, has ordered the machinery and other material for a complete waterworks plant and distributing system for Portland. The water will be brought from the town of Taft, ten miles north of Portland.

The City Council has ordered an election of taxpayers to be held at Rockdale February 25 to vote on the proposition of issuing \$30,000 of bonds for the purpose of purchasing the privately owned waterworks plant and making extensions and improvements to same.

The Bishop Water & Electric Company, Bishop, has been organized with a capital stock of \$50,000. The incorporators are F. Z. Bishop, R. R. Hall and H. T. Ellsworth.

The Gulf, Colorado & Santa Fé Railway is preparing to erect a new roundhouse, with considerable equipment, at San Angelo.

J. W. Guynes will build an ice plant at Franklin. It will have a capacity of six tons daily.

The Concho Waterworks Company will construct a waterworks plant and lay a distributing system at Paint Rock. J. W. Norman, D. B. Stone and J. B. Wade are the stockholders in the company.

The Sterling Ginning & Milling Company will build a cotton gin at Mercedes. The incorporators of the company are A. G. Crawford, W. D. Chadick and G. E. Simpson.

The Libby Mfg. Company, Mount Pleasant, which was recently organized, will engage extensively in coal mining. It will purchase considerable machinery. The incorporators are L. C. Libby, W. H. Seay and T. M. Flemming.

The Commercial Club is promoting the establishment at Big Springs of a large cottonseed oil mill.

The Pecos Valley Gas & Electric Company is preparing to add more machinery to its power plant at Artesia, N. M., and to construct extensions of its power transmission system.

The Good Luck Mining Company will need considerable machinery for its mines near Lake Valley, N. M. T. J. McKenna is manager.

The Rio Mimbres Irrigation Company is preparing to construct a large system of irrigation upon its land situated ten miles northwest of Deming, N. M. E. H. Bickford is manager.

The Southern Pacific Company is preparing to develop a large water supply five miles north of Phoenix, Ariz. The water will be brought to the shops of the company through a 6-in. pipe line.

The City Council of Bisbee, Ariz., is preparing to extend the municipal sewer system.

J. R. Cullinane of St. Louis, Mo., has purchased the Greenville gas plant and distributing system of Greenville, Texas, from James B. Murphy of Greenville and Henry W. Williams of Oklahoma City, Okla. It is planned to enlarge the plant and extend the mains.

N. G. Simpson is preparing to construct a system of irrigation near San Angelo for the purpose of watering 50,000 to 100,000 acres of land.

G. W. Buer will establish a plant near Milano for the manufacture of brick and pottery.

The Temple Electric Company, Temple, has been organized for the purpose of engaging in general electric construction work. The incorporators are James E. Ferguson, C. A. Hughes and J. E. Love.

J. C. Coulombe of Keene, N. H., contemplates erecting a plant at El Paso, Texas, for the manufacture of pneumatic hammers and drills.

The State Land Company, Houston, which was recently organized with a capital stock of \$500,000, will construct a large system of irrigation in southern Texas. The incorporators are J. H. Thompson, J. F. Sadler and Jonathan Lane.

The Kauffman Compress Company will soon begin the work of erecting a large cotton compress at Kauffman.

The City Council of Waxahachie has taken steps to enlarge the waterworks plant and reservoir system at that place. An additional deep well will also be bored to increase the water supply.

The Consolidated Reservoir Company has taken over the Grand Falls & Big Valley Irrigation systems near Pyote and has started the construction of a large water storage reservoir. The two systems will be combined and extended so as to irrigate about 80,000 acres of land.

George E. Courtney will establish a broom factory at Denton. It will have a capacity of about 1000 brooms a day.

Eastern Canada

TORONTO, ONT., January 25, 1913.

Negotiations for the locating of new manufacturing plants are no less the order of the day than ever. They are a feature that are as significant as any that could be selected to show the state of business in the country's manufacturing economy. Another is the labor market. The strong demand for manufactured products, especially for those incidental to and instrumental in the development of the country's natural resources, keeps the demand for labor of all kinds at high pressure. This is the experience at all centers, in the West no less than in the East. The regular quarterly bulletin of business openings in western Canada, issued by W. P. Fitzsimons, the Grand Trunk commissioner of industries, has just made its appearance, and the fact that it includes no less than 89 different occupations each in demand at from 1 to 20 different towns in Manitoba, Alberta, Saskatchewan and British Columbia would seem to show that there is no let up in the rapid development of the Canadian west.

The Chatham Auto Wheel Company, Chatham, Ont., has asked the City Council there to fix its assessment at \$3500 for 10 years. Its plant is to cost \$40,000. Its capital stock is to be \$100,000, with \$60,000 paid up. It will employ 40 men.

At a banquet in Guelph, Ont., to which city it is proposed to remove his company's works, Mr. Menzies, general manager of the Stewart Sheaf Loader Company, Winnipeg, said that last year the company did a business of \$600,000. The reason given for deciding to remove to Guelph is the onerousness of the labor problem in the West.

The International Sand, Lime, Brick & Machinery Company, with headquarters at Montreal, has purchased a farm near Guelph, Ont., as the site of a plant it proposes to locate there. It is understood to be contemplating an expenditure of \$90,000 on the new plant.

The West Lorne Foundry Company, West Lorne, Ont., has produced a new gasoline fire engine of its own designing.

President J. H. Plummer of the Dominion Steel Corporation, speaking of the new rail mill, said that the company is arranging for a distributing center at the head of the Great Lakes, where it may, in addition, put in a small nail mill to facilitate its Northwest business.

The Preston Car & Coach Company, Preston, Ont., has decided to enlarge its present plant at once. It will erect two buildings 60 x 200 ft. and 180 x 200 ft., respectively. James Eagle has been awarded the contract and he will put a large gang at work immediately.

The Dominion Steel Corporation has ordered additional machinery to increase the capacity of its wire and nail plants, which have recently been put on double turn. This will give at once an output of over 2000 kegs daily and ultimately provide an outlet for the whole of the product of the wire rod mills.

As a result presumably of the decision of the Quebec Government to lift the embargo placed on the exportation of pulp made from lumber cut on crown lands for several firms, on securing a promise that similar treatment will be accorded it, the St. Lawrence Pulp & Lumber Corporation, incorporated in New York State with a capital stock of \$4,000,000, has resolved to establish a \$2,000,000 pulp and paper plant in Quebec province. This announcement was made by John Hall Kelly, M. P. P., who has acted as lawyer for the corporation. He says the company will have its Canadian office at New Carlisle, Bonaventure county, and its limits at Cross Pabos, Gaspé Peninsula. He also stated that the company will manufacture paper in Quebec and ship it across the line free under the new United States custom regulation which imposes no duty on paper made from pulp cut on lands upon which there is no embargo.

Western Canada

WINNIPEG, MAN., January 24, 1913.

The industrial commissioner of Winnipeg says that the bureau has never experienced such a brisk demand for information from prospective manufacturing establishments as since the beginning of this month. These inquiries include other parts of western Canada as well as Winnipeg. As the season advances the outlook for industrial activity grows brighter. In the last few weeks representatives of several large manufacturing concerns in the East and South have visited Winnipeg and other cities to look personally over the situation. It is expected that some interesting announcements in this connection will be forthcoming shortly. Just

now the demand for machinery is moderate, as usual at this season, but the different houses anticipate a brisk year.

The Industrial Bureau of Calgary, Alberta, announces that the B. B. Rich Cut Glass Mfg. Company is preparing to establish there a factory that will employ about 50 men to start with. The president of the concern is R. T. Brooks, of Philadelphia.

It is stated that the Canadian Northern Railway will erect a large hotel at Prince Albert, Sask., at a cost of between \$250,000 and \$500,000.

The H. B. Reinforced Brick Work Company, Ltd., will establish a factory at Winnipeg in the near future. Sten Lund, of Winnipeg, is the president of the company.

The Cold Storage Company, Prince Rupert, B. C., will erect a fertilizing plant this spring and possibly a fish canning factory.

It is believed that the city of Winnipeg will soon find it necessary to add to the capacity of the municipal power plant.

The rural municipality of Assiniboia, Man., is planning to install an electric light plant this year. The secretary is Frank Ness, Kirkfield Park, Man.

A broom factory is to be added to the jail the Provincial Government maintains at Lethbridge, Alberta, and machinery is to be put in at once.

The City Commissioners of Edmonton, Alberta, have decided to spend \$50,000 or \$60,000 upon machinery for a street paving plant.

Government Purchases

WASHINGTON, D. C., January 27, 1913.

The Paymaster-General, Navy Department, Washington, will open bids February 4 under schedule 5105, classes 2 to 49, inclusive, for the following machine tools to be delivered to Boston, Mass.:

One precision bench lathe, one tool room lathe, three bench lathes, two lathes, one tool maker's engine lathe, one geared-head electric motor-driven lathe, three semi-enclosed electric motor-driven lathes, one motor-driven instantaneous-change gear engine lathe, one heavy extension gap engine lathe, one motor-driven flat turret lathe, one 10-in. motor-driven slotting machine, one motor-driven self-contained plain cylinder gap grinder, one horizontal boring, drilling and milling machine, one centering machine, one vertical boring and turning mill, one boring and turning mill, one motor-driven engraving machine, three upright drilling machines, one motor-driven radial drilling machine, one open-side planing machine, one medium-metal planing machine, one motor-driven cold metal saw, one combination cutter, reamer and twist drill grinder, two back-geared heavy-duty crank shaper, one No. 2-B heavy planing and milling machine, one No. 3-A universal milling machine, one No. 4-B plain milling machine, three wet tool emery grinders, three power hack saws motor-driven, three hand power arbor presses, one hand power embossing machine, one combined band saw filing and setting machine, one motor-driven radial drilling machine, one motor-driven double-ended punch and shear, one pipe-threading and cutting machine, one motor-driven 4-ft. universal radial drilling machine, one hydraulic stanchion pipe bending machine, one motor-driven geared plate bending rolls, one motor-driven patternmaker's extension bed gap lathe, one 12-in. patternmaker's motor head speed lathe, one universal woodworker, one universal wood trimmer, two improved bench wood trimmers, one motor-driven universal double-arbor saw bench, one motor-driven 20-in. hand planing and jointing machine, one hand driven slip roll former, one vertical turret lathe and one motor-driven sensitive bench drill.

The Paymaster-General, Navy Department, Washington, will open bids February 11, schedule 5129, class 41, for two 40-in. triple geared variable speed boring and turning lathes for delivery to Washington, and schedule 5130, class 51, for one drill, tap, reamer and die testing machine.

The office of the secretary, Mississippi Commission, Leggett Building, St. Louis, Mo., will open bids February 7 for construction and delivery of twin screw engines and propelling machinery.

The United States Marine Corps, Depot of Supplies, Philadelphia, Pa., will open bids February 5 for one ring and circle shears, one power press complete, one flanging and heading machine, one brazing table, type A, one combination oven, crucible and forging furnace, one heavy duty, back geared shaping machine, one power squaring shears, one 2½-in. slip roll forming machine, one power hack saw and one geared head improved screw cutting engine lathe.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids February 21 for one 15-ton locomotive crane to be delivered and erected at the navy yard, Portsmouth, N. H.

The Paymaster-General, Navy Department, Wash-

ington, will open bids February 4, under schedule 5102, class 1, for one crank shaft lathe to be delivered to Puget Sound. The same department will open bids February 11, schedule 5109, class 1, for one sand blast, one separator and one dryer for delivery to Mare Island.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids January 21 for material and supplies for the navy yards as follows:

Schedule 5088, class 31, one geared-head motor-driven lathe—Bidder 51, Fairbanks Company, Washington, D. C., \$967 and \$1,002; 69, Kemp Machinery Company, Baltimore, Md., \$893.40; 80, Manning, Maxwell & Moore, New York, \$1,078.10; 167, Prentiss Tool & Supply Company, New York, \$1,035.

Schedule 5089, class 41, one screw driver and boring machine combined—Bidder 95, L. G. McKnight & Sons Company, Washington, \$125; 97, National Contracting Company, New York, \$570 and \$590.

Class 42, one 5-opening chair-back-bending machine—Bidder 51, Fairbanks Company, Washington, \$437; 95, L. G. McKnight & Sons Company, Washington, \$325.

Class 43, one 2-drum oscillating sanding machine—Bidder 51, Fairbanks Company, Washington, \$227; 95, L. G. McKnight & Sons Company, Washington, \$175.

Class 44, one 5-spindle boring machine—Bidder 36, Defiance Machine Works, Defiance, Ohio, informal; 48, J. A. Fay & Egan Company, Cincinnati, Ohio, \$355; 95, L. G. McKnight & Sons Company, Washington, \$225.

Class 45, one hand bending machine—Bidder 51, Fairbanks Company, Washington, \$327; 95, L. G. McKnight & Sons Company, Washington, \$150.

Trade Publications

Double Arbor Buffing and Polishing Machine.—Excelsior Tool & Machine Company, East St. Louis, Ill. Circular No. 33. Deals with a double arbor buffing and polishing machine, which consists of two independent lathes in one. The special features claimed for the machine are ease in operation, simplicity of design and large capacity. Views of the tool, with the dust hoods attached and removed, are given. An illustrated description of this machine appeared in *The Iron Age*, October 10, 1912.

Die Castings.—Doehler Die Casting Company, Court and Ninth streets, Brooklyn, N. Y. Pamphlet. Pertains to a line of machine parts which are made by the die casting process. Among these are parts for automatic photographing machines, magnetos, various electrical and time controlling devices, cash registers, pumps, typewriters, etc. Views of some of these are given, together with a description of the process by which they are made.

Metal Working Machinery.—W. P. Davis Machine Company, Rochester, N. Y. Several loose leaf circulars. Describe and illustrate a number of machines which have recently been added to the company's line. These comprise adjustable-speed motor-driven lathes, in swings ranging from 12 to 32 in., a 6-in. cutting-off machine, 14 and 16 in. lathes and a 20-in. upright back-geared drilling machine with power feed. The make-up of the several circulars is identical, an engraving of each tool being given at the top, while a brief description with a condensed table of specifications occupies the remainder of the circular.

Electrical Machinery and Appliances.—Sprague Electric Works of the General Electric Company, 527 West Thirty-fourth street, New York City. Pamphlet No. 117, superseding No. 114. Relates to the various Sprague electric products, which include electric generators and switchboards, direct and alternating current motors, printing press equipments, electric fans and hoists, several types of conductors, and flexible and rigid conduits and fittings. All of these are illustrated and briefly described and there is a list of the other publications of the company, which give more complete information about the various lines.

Screw Cutting Engine Lathes.—Hendey Machine Company, Torrington, Conn. Catalogue. Size, 6 x 9 in.; pages, 147. Illustrates and describes a line of quick change gear screw cutting engine lathes. The line consists of lathes of the regular belt-driven cone pulley head type with swings ranging from 12 to 32 in., all-geared drive heads with 12 to 24 in. swing, and a modified geared drive form of head for the 32-in. lathe designed for adjustable-speed motor drive. For the most part the tools are illustrated on one page with brief descriptions and tables of specifications on the facing ones. Mention is also made of a number of attachments that can be supplied with the various tools.

Belt Dressing.—Cling Surface Company, Buffalo, N. Y. Folder. Pertains to Cling Surface belt dressing. Illustrated with view of interiors of power plants of various kinds showing equipment with belting on which the dressing is used, the illustrations being accompanied by letters from users.

Special Metal Stampings.—Kales-Haskel Company, Detroit, Mich. Folder. Lists an extensive line of dies for sheet metal stampings. Illustrations are given of some of the stampings, washers, tempered steel springs and screw machine products of the company.

Bench Filing and Hack Sawing Machine.—Fairbanks Company, New York City. Circular. Describes and illustrates the Simplex combination bench filing and hack sawing machine. One of the special uses of this machine is in the making of dies, and the method is described at some length.

